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The Arris and Gale Lecture

ON THE

NERVE-SUPPLY OF THE PARIETAL PERITONEUM

AND SUBPERITONEAL TISSUES.

WITH REMARKS ON THE CLINICAL SIGNIFICANCE THEREOF.

Delivered before the Royal College of Surgeons of England on Feb. 13th, 1922,

BY V. ZACHARY COPE, M.D., M.S. LOND., F.R.C.S. ENG.,

SURGEON TO OUT-PATIENTS, ST. MARY'S HOSPITAL, LONDON; SURGEON TO THE BOLINGBROKE HOSPITAL.

AT one time it was thought that the peritoneum had no nerve-supply. Many observers have shown that opinion to be incorrect, but the supply of nerves to the peritoneum is not very extensive, and the title of this lecture was chosen because I agree with Hertzler's view that for purposes of practice and experimentation the transversalis fascia and the rest of the subperitoneal tissues must be considered as one structure with the peritoneum itself. It is not difficult to trace nerves into the former, whilst great difficulty may be encountered in tracing them to the peritoneum.

The nerve-supply of the internal lining of the abdominal cavity can in most parts be fairly easily ascertained by anatomical dissection. In parts where large nerves course through the parietes twigs can be followed to the subperitoneal tissue, and in some parts—e.g., the diaphragm—medullated nerves may without much difficulty be traced to the peritoneum by microscopical examination. Other areas have a nerve-supply very difficult to trace to its source, and in such cases clinical and embryological assistance is of value. On clinical and anatomical grounds there can be no doubt that the diaphragmatic area is supplied with fibres from the phrenic nerve; I have strong clinical evidence that the same nerve also supplies the peritoneum covering the vena cava at the posterior boundary of the foramen of Winslow. Similarly, the peritoneum and subperitoneal tissues of the anterior and lateral abdominal wall are supplied by the lower seven dorsal and the first lumbar (ilio-hypogastric and ilio-inguinal) nerves. In the area of the quadratus lumborum and ilio-psoas it is almost impossible to distinguish between the afferent nerves supplying the superficial fibres of the muscle (lumbar 1 and 2) and the tissues over the muscle. The twelfth dorsal nerve supplies part of the tissues over the quadratus, and the first lumbar is certainly responsible for the supply to the area over the iliacus.

There are strong reasons for thinking that in the central area of the posterior abdominal wall few afferent parietal nerves are to be found, and of those few it is exceedingly difficult to ascertain the origin. On embryological grounds, however, Prof. J. E. S. Frazer considers that the parietal peritoneum between the ascending colon and the mesenteric attachment is derived chiefly from the right tenth and eleventh dorsal nerves, whilst between the descending colon and the middle line the right twelfth dorsal nerve sends fibres. In the pelvis what nerves go to the parietal lining are, according to Prof. Frazer, probably derived from the fourth and fifth lumbar and the sacral nerves. The uncertainty concerning the nerve-supply to the mid-abdominal and the pelvic areas is largely owing to the fact that stimulation of these areas does not give rise to any clinical localising symptom or sign—e.g., rigidity, hyperæsthesia, referred pain. For clinical purposes, indeed, it is very useful to divide the abdominal parietal lining into *demonstrative* and *non-demonstrative* areas. The demonstrative area is the larger, and includes all the lining of the abdominal cavity except the central and inferior part of the posterior abdominal wall. The non-demonstrative region comprises the pelvis and that part of the posterior abdominal wall bounded roughly by the ascending colon, the descending colon, and the transverse mesocolon. The distinction is a clinical one, but must have an anatomical basis in a relatively free or meagre afferent nerve supply. The non-demonstrative area is probably supplied chiefly via the sympathetic system, the demonstrative from the main somatic nerves. In the renal region there are more nerves in the connective tissue behind the kidneys than in the peritoneum in front of that viscus; indeed, the latter region should be included in the non-demonstrative area.

The clinical application of our knowledge of the nerve-supply of the parietal peritoneum depends upon the various ways in which irritation of the nerve-terminals may be made known. Such irritation may be evidenced by (1) local pain and sensitiveness; (2) referred pain; (3) hyperæsthesia; (4) hyperalgesia; (5) muscular rigidity; (6) alteration of muscular reflexes.

The manifestations depend partly upon the *nature of the irritant*. The normal parietal peritoneum is almost insensitive to touch, though the tissues beneath the membrane show a greater degree of sensibility. Clear non-infective and non-toxic fluids—as, for example, the serous fluid of ascites or the sanguineous liquid which floods the peritoneal cavity on the rupture of a gestation sac—do not cause any irritation other than the mere mechanical effect of the pressure or the sudden flooding. Quite different is the effect on the cœlomic lining tissues of the acrid and acid fluid which pours from a perforation of the stomach, or which collects in response to bacterial irritation. In such cases the peritoneum becomes congested, and the subperitoneal tissues swell with œdematous fluid. Even when bacteria are the cause of the irritation the response is capricious, variable, and dependent on several factors not easily estimated.

1. LOCAL PAIN.

The local pain due to parietal irritation varies in amount and diagnostic value according to the part affected. The non-demonstrative areas of the peritoneal cavity furnish little localising indication of acute irritation. Though the sign of local tenderness on deep pressure over any irritated area is almost always to be elicited, yet it is possible for the most serious pathological process to be proceeding within the pelvis or against some parts of the posterior abdominal wall without there being any spontaneous definite localising symptoms. Sensibility is greatest in the anterior part of the abdominal cavity. In any part where a muscle lies immediately under the peritoneum it is difficult or impossible to separate entirely the sensibility of the one and the other. This is specially the case with the diaphragm, where there is comparatively little subperitoneal connective tissue. When the subperitoneal tissue lying over a muscle becomes œdematous and irritated, movement of the subjacent muscle causes local pain. This is most clearly demonstrated in the case of the psoas. Frequently in the early stage of peritoneal irritation over that muscle active flexion of the thigh will cause pain to be felt in the iliac fossa. Occasionally the pain is felt on straightening the limb. Operation in such a case reveals the very œdematous tissues over the muscle. The intervention of the thick obturator fascia prevents the practice of such a delicate test in the case of that muscle, but whenever the inflammatory process is intense enough to pierce the fascia—as, for example, when an appendicular abscess lies against it—then what I have elsewhere termed the obturator test will be positive. (The obturator test consists in the eliciting of pain in the right lower abdomen on full internal rotation of the flexed right thigh.) A test whereby it is sometimes possible to demonstrate irritation of the peritoneum in the neighbourhood of the iliac vessels is what may be termed

the *femoral test*. Compression of the common femoral artery just below Poupart's ligament causes increased pulsation of the iliac artery, and if there be neighbouring peritonitis this simple test may, as one patient expressed it, "draw the pain to that part"—i.e., cause local pain over the iliac vessels. In the first case in which I found the test positive the peritoneum over the psoas was so œdematous that I could easily bring it out of the anterior abdominal wound.

Localising Value of Parietal Peritoneum when Not Inflamed.

So far I have been speaking of the localisation of pain felt in irritated parietal peritoneum and adjacent tissues. Though slightly off the main subject of the lecture, I wish now to consider the localising value in detecting visceral disease of parietal peritoneum which is not itself inflamed. Under certain conditions pain results from abnormal states of the viscera. This pain is frequently referred to other parts because, though sensitive, the intestine or other viscus is dumb, and depends upon the nerves of other parts to demonstrate its disease. Distended gut has no way of indicating the position of the painful sensation originating within it, except by the aid of the localisation afforded by the parietes. The same holds good with the inflamed appendix. This view presupposes that pain is felt in the viscera. I am aware that this is in opposition to the views expounded so ably by Sir James Mackenzie,[1] who writes:

"When we find the surgeon or physician demonstrating the sensitiveness of any viscus, it will be realised that he is, in reality, stimulating in his examination those extremely sensitive structures of the external abdominal wall, and referring the pain he elicits to an organ that is totally insensitive to any such stimulation."

Though in many instances the statement may be true, yet I believe there are many exceptions. During the acute stage of visceral inflammation the referred symptoms are often chiefly in evidence; but during the subsidence of inflammation, and also in slight cases, one may often demonstrate a sensitive viscus. In a case of very early, very mild, or subsiding appendicitis, where there is no overlying muscular rigidity or resistance, one can often elicit pain on deep pressure at a point about an inch below and internal to the mid-point between the umbilicus and the right anterior superior iliac spine. Whatever the position of the appendix this point nearly always corresponds to the site of its junction with the cæcum, and pressure there should cause an increase in tension within the appendix. Frequently no pain is elicitable anywhere else and no hyperæsthesia of the skin is present. That such pressure-pain is not due to hyperæsthesia of the abdominal wall can be proved by a simple experiment. By pressing directly backwards on a series of areas round the sensitive spot no pain is produced, but if pressure is directed on those same areas obliquely towards the affected deep spot then pain is produced. If the abdominal wall is completely lax this oblique push makes no appreciable extra tension on the structures in the abdominal wall immediately overlying the sensitive viscus.

Another example of pain felt in a viscus is furnished by an intussusception. The tenderness in an intussusception, quite apart from peristalsis, is usually to be elicited over the lump and not in the usual areas of reference of pain reflected from the segment of bowel affected. Pain from the large bowel is usually referred to the sub-umbilical region, and from the small bowel to the epigastric and umbilical regions. Yet I have notes and memories of many large-bowel intussusceptions with a painful lump in the epigastric region, and I have recently operated on a patient with a large tender lump in the left iliac fossa which proved to be an intussusception of the middle portion of the small intestine. I believe therefore that inflamed distended intestines (and possibly other viscera) are sensitive to pressure from without. It is in relation with this sensibility that the localising function of the parietes comes into play. The site of visceral disease is fixed by the touch-sensation of the contiguous parietes. In appendicitis the symptoms are referred (if there be no peritonitis or adhesions) until the observer puts his finger on the abdominal wall and presses upon the appendix. Pain is then felt in the appendix, and is localised by the opposing parietes. To a person who has no sense of musical tones the only way that a note struck on the piano could be identified would be by observing which note on the keyboard had been struck. The sound comes from the string, and is heard by every listener, but the only indication to the tone-deaf person is the keyboard. Similarly viscera give rise to painful stimuli which are not accurately localised apart from contact with some adjacent tissue which possesses power of localisation.

Intestinal Distension.

A further example of localisation of gut-pain by the parietal peritoneum is afforded by the pain of intestinal distension. In most cases of intestinal obstruction with distension pressure over any distended coil causes pain at the spot pressed upon. The pain is never referred to the areas usually associated with that particular portion of gut, and is felt in any part of the abdomen where pressure on a distended coil be made, whether in the loin, upper or lower abdomen, or in the pelvis by rectal approach. Few can doubt that such pain is felt in the gut itself, and yet we know that if such a coil were outside the abdomen and manipulated the patient would not be able to localise the vague pains induced. It is the parietal peritoneum and the overlying structures which enable the pain to be localised.

Peristaltic movements of the intestine, again, are not usually localisable by the patient, but if the moving coil be pressing against or dragging upon the abdominal wall he is sometimes able to tell the direction of peristalsis. I remember one particular case of obstructed umbilical hernia in which the patient definitely stated the pain travelled from left to right, and in exploring the sac I found a coil of small intestine obstructed and firmly adherent to the peritoneum of the sac for several inches. The direction of the coil was from left to right, and the localisation of the peristaltic pain was quite accurate. I believe that the realisation of the localising function of the parietal peritoneum in connexion with visceral pain will enable otherwise conflicting views to be reconciled.

2. REFERRED PAIN.

Referred pain has been the subject of many classical studies in connexion with the viscera, but I have seen comparatively few references to pain referred elsewhere from irritation of the abdominal lining. Head states that—

"affection of the serous cavities of the body do not cause referred pain or cutaneous tenderness but produce local pain which follows the lines of peripheral nerves and is associated with deep tenderness over the affected part only."

And again—

"Inflammation of the pericardium, pleura, and peritoneum causes no reflected pain or superficial tenderness of the visceral type."

I think there are exceptions to these statements.

No referred pain of any localising value is ever furnished by the non-demonstrative areas. Occasionally in pelvic peritonitis a patient will complain of pain over the hip or sacral region, but it is seldom or never possible to prove that the latter is due to parietal irritation. In the lateral and anterior abdominal wall the deep and superficial tissues are supplied by the same nerves; pain is seldom referred away from the affected spot, and certainly never spreads over to the areas supplied by the nerves of an adjacent spinal segment. At the same time I am of opinion that superficial tenderness accompanying parietal peritonitis is often a true referred pain.

Clinical Value of Phrenic Shoulder-Pain.

That part of the abdominal lining in which diagnosis is most aided by referred pain is the diaphragmatic area. It is now nearly two years since I was

impressed by the clinical value of phrenic shoulder-pain. So far as I am aware, no serious study on this subject has ever been published in this country, though on the Continent and in America considerable attention has been paid to it. Several English writers have noted the occurrence of shoulder-pain in abdominal disease, and have attributed it to a pain reflected via the phrenic nerve. Hilton[2] observed it, and 30 years ago Ferguson[3] proved that the phrenic nerve contained afferent fibres; but for many years it has been taught and apparently generally thought that such referred pain was due to the stimulation of fibres of the phrenic which were found in the viscera. Mackenzie states that fibres of the phrenic supply the bile-ducts, and he adduces this statement to support his view that shoulder-pain in biliary colic is due to the phrenic stimulation in those ducts. This appears an unnecessary assumption. All clinical, pathological, and operative findings combine to make me believe that shoulder-pain due to intra-abdominal disease is always due to the irritation of the peritoneum over the diaphragm, or of the muscle or connective tissue over the muscle.

The phrenic nerve is on each side derived mainly from the fourth cervical nerve, and may obtain some fibres from the third and fifth cervical nerves; the two nerves supply the whole of the central portion of the diaphragm, with the serous membrane and connective tissue on its upper and lower surfaces. Irritation of the structures supplied by the nerves frequently causes pain to be referred to the area on the corresponding shoulder supplied by the fourth and occasionally that supplied by the third and fifth nerves. That the irritation of the peritoneal covering is sufficient to cause the referred pain is inferred from the fact that occasionally the pain in the shoulder is felt *immediately* at the onset of symptoms due to perforation of a gastric ulcer. The pain in the shoulder region is often overshadowed by the abdominal pain, and is frequently self-diagnosed and minimised by the patient, who terms it "rheumatism." On inquiry it will be found to be a symptom in a great number of acute abdominal conditions. I have known it occur in cases of perforated gastric and duodenal ulcer, perinephritis, peritonitis spreading from the gall-bladder, or from the appendix, acute hæmorrhagic pancreatitis, ruptured ectopic gestation, subphrenic abscess, liver abscess, splenic infarct, and dilated stomach. It must also be remembered that diaphragmatic pleurisy may cause similar shoulder-pain. It would take me too long to give clinical instances, but I have come to regard the symptom as a valuable one in differential diagnosis. That it is a common symptom with perforated ulcers may be concluded from the fact that in the eight such cases seen by me during the last year it was present in seven. Phrenic shoulder-pain is as a rule not intense, but of a dull aching character. It is usually felt more acutely on taking a deep breath. It may be felt continuously or only for a short time in the course of the particular disease. In liver abscess the pain is often more intense and persistent, but is only felt in those abscesses which encroach on or irritate some part of the diaphragm or its covering.

Judging from the clinical cases I have seen, the position of the pain on top of the shoulder varies according to the site of irritation of the diaphragmatic peritoneum and underlying muscle. Pain is referred to the right shoulder from the under surface of the right side of the diaphragm, and similarly from the left side to the left shoulder. Moreover, I have on many occasions noticed that irritation of the anterior part of the diaphragm causes pain over the clavicular region, whilst inflammatory conditions under the posterior part cause pain in the supraspinous fossa. The maximum site of pain when the dome is irritated is the acromio-clavicular joint. If pain is felt equally on top of both shoulders a median irritation is present. In keeping with this view is the fact that most liver abscesses cause pain in the supraspinous fossa, since it is well known that the posterior and upper part of the liver is the commonest site for abscess. In accordance with this interpretation it is to be expected and actually happens that a perforated pyloric or duodenal ulcer more often causes pain in the right supraspinous region, whilst an anterior gastric perforation may cause pain on top of the left or both shoulders in the acromio-clavicular regions, or pain in the left clavicular region. Though the fourth cervical nerve area is the one usually involved, I have notes of more than one case in which the fifth segment was apparently affected. One instance was that of a clergyman whose pyloric ulcer perforated. He complained of pain over the right deltoid muscle, pain and feeling of stiffness in the right shoulder-joint, and stated that his right arm felt weak. I could but conclude that the fifth segment was involved and that the muscle-sensory fibres were reflexly affected.

It is very rare for shoulder-pain to be felt in cases of appendicitis, but whenever felt it is an indication that the inflammation has reached the peritoneum over the diaphragm. Such pain never comes on till some hours after the onset of the general abdominal pain. If supra-scapular pain is felt at the onset of the abdominal pain the condition is more likely to be due to a perforated pyloric ulcer.

The Connexion of Shoulder-pain with Gall-stone Disease.

I have mentioned above that peritonitis spreading from the gall-bladder may irritate the diaphragmatic peritoneum and subjacent tissues, and cause pain on the top of the shoulder. Conversely, I have found that pain on the top of the shoulder in gall-stone disease is always due to diaphragmatic irritation. I have carefully questioned and examined my cases of biliary colic, cholecystitis and cholelithiasis, and have correlated the conditions found at operation with the account given; in addition, I have tried assiduously to find any definite case of uncomplicated biliary colic causing pain on the top of the shoulder, but I have failed to find any evidence against the view that the pain on top of the shoulder felt in gall-stone disease is always due to irritation of the phrenic nerve-endings in the diaphragm and neighbouring peritoneum, and not in the bile-ducts or liver. In days when the abdomen was not opened for gall-stones whilst the patient was alive there was excuse for the view that pain on top of the shoulder was caused by the mere passing of a stone along the duct. A phrenic twig to the liver or biliary ducts served as sufficient anatomical reason for the fact of such pain. In Reynolds's System it was stated that in biliary colic the pain sometimes radiated to the clavicles. In Bristowe's System it was asserted that the pain might radiate to the shoulder-tip. One of the best modern Systems is more indefinite in stating "pain radiates over the abdomen and to the right scapula; but in some cases the pain radiates to the left shoulder." I think it is due to indefinite and inaccurate statements such as the last-mentioned that there has been delay in recognising the view that I put forward. True biliary stone-colic causes pain usually just below the inferior angle of the right scapula, but seldom or never in the acromio-clavicular region. In loose writing "the shoulder" means anything from infrascapular to suprascapular region. In considering biliary colic and referred pain caused thereby one must realise that pain similar to that caused by the passing of a stone can be caused by inflammatory conditions, and that the passing of a gall-stone along the ducts may in itself lead to contiguous inflammatory changes.

Kehr[4] states:—

"One thing can be confidently asserted. It is by no means necessary (for biliary colic) that a stone should stop up the duct, for an inflammation of the gall-bladder without stone and a swelling of its ducts can produce a pain indistinguishable from biliary stone colic."

He continues:—

"It would in my opinion be better if we abandoned the term stone colic, for the stone as a foreign body causes generally no pain. I have found a stone stuck in the neck of the gall-bladder and in the duodenal papilla without the

patient having any pain. Why? Since inflammation was absent in each case."

In Osler and Macrae's System of Medicine [5] an enlightened view is expressed:—

"In the great majority if not in all cases local examination (in gall-stone colic) reveals tenderness, abdominal rigidity and the other local phenomena of acute cholecystitis."

It is also stated that—

"gall-stones are absent in 15 per cent. of patients who have colicky pains."

The writer concludes that—

"gall-stone colic therefore should be interpreted rather as evidence of acute cholecystitis or acute exacerbation of chronic cholecystitis."

My own views do not entirely coincide with these expressions of opinion, but the point which I wish to make is that whenever pain diagnosed as biliary colic causes pain on top of the shoulder there will be found irritation or inflammation of the tissues over the diaphragm. The following case illustrates this point:—

Mrs. C., aged 68, who had had three attacks of pain in the right hypochondrium during the last few years, was taken ill five days before I saw her (in April, 1921) with pain in the right upper abdomen radiating through to the right infrascapular region. When I saw her the temperature was 100° F., and though there was no abdominal-wall rigidity there was pain felt on pressing deeply over the gall-bladder. No pain had been felt on the top of the shoulder. She was moved to hospital and the first thing she said to me when I saw her there was that on the journey she had felt pain all over the top of the right shoulder. Operation showed acute cholecystitis, omental adhesions, free fluid, and spreading peritonitis. One large gall-stone was found in the gall-bladder.

The difficult passage of a stone along a muscular tube may undoubtedly cause contiguous peritonitis. I recently operated on a woman, aged 60, for intestinal obstruction caused by a gall-stone, which I removed from the middle of the small intestine. At the operation I observed a coil of intestine, about a foot or more above the part from which the stone was extracted, which was very red, œdematous, and acutely inflamed with particles of yellow lymph on the peritoneal coat. At first I thought there was a perforation, but scrutiny showed it was only acute local peritonitis which had spread from the intestine at the site of a prolonged stoppage of the gall-stone. I have seen a somewhat similar inflammatory condition round the bile-ducts after an acute biliary colic, though no stone was found at operation, and concluded that the mere passing of a stone may cause contiguous peritonitis.

Some years ago Mr. Mayo Robson [6] wrote an interesting note on three cases in which pain at the tip of the shoulder was a prominent symptom, and in none was the pain due to gall-stones. All three were due to tumours growing at the upper end of the kidney. The explanation offered for the pain was that a small branch of the phrenic passes to the semilunar ganglia. In view of the necessary irritation of the tissues over the diaphragm by such tumours such an explanation is hardly needed. Many mistakes in diagnosis have been made, and will be made until it is realised that biliary-stone colic, apart from parietal peritonitis, does not cause pain on the top of the right shoulder, and that if such pain be present at the onset of an acute case, the condition is much more likely to be due to perforation of a duodenal ulcer than to gall-stones. The one possible exception to the statement that the passing of a gall-stone does not cause pain on top of the shoulder is that of a stone passing through, or impacted in, the ampulla of Vater. Here the right crus is very near the stone, and the latter may cause œdema of the surrounding tissues and irritation of the tissues round the crus.

3. HYPERÆSTHESIA.

A question which I have tried to answer is whether increased sensitiveness (hyperæsthesia) of the skin may result from irritation of the parietal peritoneum and adjoining tissues. Hyperæsthesia caused by disease of the abdominal viscera has frequently been discussed; but very little, if any, account has ever been taken of the possible coincident parietal irritation. During the past year I have carefully studied about a hundred cases of acute and subacute appendicitis with this object. Appendicitis is a disease in which during the early pathological stages the viscus alone is implicated, whilst in more advanced stages the parietal peritoneum becomes implicated in greater or less degree. It is a disease also in which there is usually the one pathological lesion, and since removal of the appendix is the usual indication one can easily study the condition of the parietal peritoneum, whilst noting the effect on the hyperæsthesia of the removal of the affected viscus.

Twenty years ago Mr. James Sherren [7] wrote an excellent and pioneer article on hyperæsthesia in appendicitis. From his article I gather he used the term "hyperalgesia" where I should use "hyperæsthesia." He pointed out that—

"in appendicitis cutaneous hyperalgesia varies from a complete band extending on the right side from the middle line below the umbilicus in front to the lumbar spine behind, down to a small circular spot a little above the middle point between the umbilicus of the anterior superior spine. The band corresponds to the eleventh dorsal area of Head. Very often the tenderness extends somewhat into the tenth dorsal area also and occasionally, but not often, into the twelfth dorsal area, sending a tongue-shaped process over the gluteal region. The width of the band is in an adult about three inches. The normal area is on the right side of the abdomen and is of a triangular shape. Its lower boundary reaches almost to Poupart's ligament, its inner (border) almost to the middle line, and its apex is a little outside the anterior superior spine sometimes extending to the mid-axillary line."

Anyone who has regularly tested for hyperæsthesia in appendicitis will at once recognise the areas that Mr. Sherren described, but since in his cases the exact condition of the parietal peritoneum at the time of the examination was not always determined or recorded, one could not always tell whether parietal irritation played a part in causing the increased sensibility.

Hyperæthesia After Removal of the Appendix.

In cases of appendicitis without any accompanying parietal irritation I have usually found the right tenth dorsal segmental area or the anterior part of that area hyperæsthetic. It is quite common also for the eleventh segment to be affected. When there is a triangle of hyperæsthesia I have usually found the area to extend to the middle line and to Poupart's ligament, and in most of these cases operation has revealed commencing peritonitis. So frequently was this the case that for a time I conceived the opinion that the triangle of hyperæsthesia was due chiefly, if not entirely, to parietal peritonitis, but this opinion could not be maintained. In many cases, however, removal of the appendix does not lead to the immediate cessation of the hyperæsthesia. I have come to the conclusion that the anterior triangle of hyperæsthesia in appendicitis is usually due to a summation of stimuli from the appendix and the parietal peritoneum, and that it is probably irritation of the latter (supplied by the tenth, eleventh, twelfth dorsal and first lumbar) which causes the increased sensitiveness to be limited to the anterior abdominal wall.

When there has been a triangle of hyperæsthesia the part which remains hypersensitive longest after removal of the appendix is the area just above Poupart's ligament. I think it extremely likely that hyperæsthesia of that area is due only to parietal irritation, since (1) I have frequently noted that area hypersensitive in appendicular abscesses in the iliac fossa; (2) it is more likely that the tenth and eleventh segmental areas would remain hypersensitive longest if the condition were due to the appendical disease, for the twelfth dorsal and first lumbar segmental areas are more rarely affected by uncomplicated appendicitis; (3) the peritoneum in the iliac fossa is that which would be most irritated by peri-appendicular inflammation, and the pain would naturally be referred to the first lumbar segmental area.

Head[8] has recently maintained that in local appendicular peritonitis the loin is not tender on deep pressure, and that with pain referred from the appendix there is superficial tenderness in the loin corresponding to the posterior portion of the segmental areas affected. I do not think that test very reliable for distinguishing between visceral and parietal irritation. In acute affections of the upper abdomen increased cutaneous sensibility is not so common as in diseases of the lower abdomen. A gall-stone trying to pass through the cystic duct may cause referred pain to the eighth and ninth dorsal segmental areas, but I have seldom seen cutaneous hyperæsthesia unless there were at the same time cholecystitis and peritonitis. Acromial hyperæsthesia sometimes occurs in cases of acute irritation of the phrenic nerve-endings. In one case a young woman with perforated gastric ulcer had extreme sensitiveness over both acromio-clavicular joints simultaneously with the onset of abdominal pain. As a rule, however, irritation of the peritoneum over the diaphragm causes merely referred pain, not hyperæsthesia.

4. HYPERALGESIA.

In the previous section I have used the term hyperæsthesia to mean increased cutaneous sensibility of moderate amount. Some writers appear to apply the term hyperalgesia where I use hyperæsthesia. I reserve the term cutaneous hyperalgesia for the occurrence of definite and severe pain on lightly touching the skin. The sensation is not merely different from that felt in contiguous skin, but is sufficient to make the patient cry out when touched. In such cases one will nearly always find immediately under the hyperalgesic area an inflamed viscus or abscess close up and adherent to the parietal peritoneum. The area is always very circumscribed.

5. MUSCULAR RIGIDITY.

In acute abdominal disease muscular rigidity may be voluntary (of cerebral origin) or reflex in origin. The reflex stimulus may come from the parietes or from the viscera. It is in many cases difficult to appraise the exact amount of rigidity due to the patient's fear or apprehension. The observer learns in time to discriminate the psychic from the reflex factor, but only experience will teach the distinction, and that but imperfectly. When the cerebral factor can be excluded one must try to determine whether the reflex cause is visceral or parietal. Observation of operation cases has convinced me that in most cases of persisting rigidity the stimulus is from the parietes. I am well aware that experiments on animals prove that a viscero-motor reflex exists, and I well know that such a reflex frequently occurs in human beings. But *persistent* rigidity is seldom caused by visceral stimuli in acute abdominal disease. The viscera are not sensitive to ordinary tactile and other stimuli, but it is generally allowed that they are responsive to tension and distension. The greatest stimulus that nature or disease could provide would seem to be an acute distension of a viscus. Yet how often has one seen an acutely distended kidney or gall-bladder, without any rigidity of the overlying muscles? During the wave of intestinal peristalsis which can be seen to pass across the abdomen in cases of obstruction is there any evidence of contraction of the muscles of the abdominal wall? I am aware that abdominal-wall rigidity has been noted in the colics, but the rigidity only lasts with the paroxysm, unless there is coincident parietal irritation. Sir J. W. Thomson Walker has kindly informed me that in his experience after the paroxysm of pain of renal colic is over one can get the hand deep into the loin. In pyelitis one sometimes finds rigidity and sometimes not. The difference, I believe, is due to the involvement or non-involvement of the adjacent parietal tissues. Similarly in cases of persistent muscular rigidity in cases of biliary colic I find there is always contiguous peritonitis and parietal irritation. I have often found a stone tightly impacted in the cystic duct, and a greatly distended gall-bladder giving typical referred pain to the eighth and ninth dorsal segments, but the abdominal wall has always been lax over such a gall-bladder unless there has been spreading infection. This view is in keeping with the views given above as to the nature of biliary colic.

Before we can say that a diseased viscus can cause persistent parietal rigidity irritation of the parietal peritoneum and subperitoneal tissues must be carefully excluded. This can only be done by the operating surgeon. Post-mortem work cannot help very much because slight degrees of œdema and congestion may not be noticeable post mortem. In a series of about 140 cases of acute abdominal disease which I have carefully observed during the past year before and during operation I have seen but three or four clear cases of persistent rigidity of the abdominal wall caused by a diseased viscus alone. There has nearly always been parietal irritation when there has been rigidity persisting.

Persistent Rigidity not a Sign of Appendicitis.

If a distended and inflamed appendix commonly causes rigidity of the abdominal wall, why does it so seldom cause that rigidity when lying unperforated and with no peritonitis at the bottom of the pelvis? Why does the abdominal wall usually remain lax when the inflamed but unperforated appendix lies behind the end of the ileum or behind the coils of intestine in front of the sacrum? If there be rigidity preventing any segment of the abdominal wall moving on taking a deep breath, it can generally be concluded that there is irritation of the parietal peritoneum; conversely, there may be an inflamed, distended, or perforated appendix, a suppurating tube, a ruptured intestine, or a strangled coil of gut without parietal rigidity if the diseased viscus lies away from and causes no irritation of the demonstrative areas of parietal peritoneum. Text-book teaching which states that rigidity is a prominent sign of appendicitis is falsified by half the cases of acute appendicitis that I see and operate upon. It can be confidently asserted and easily maintained that rigidity is a common sign not of appendicitis but of the accompanying parietal peritonitis. I consider it dangerous doctrine to teach that persistent rigidity in acute abdominal disease is not usually due to parietal irritation.

One exception, however, must be made—the rigidity accompanying acute pancreatitis. In acute inflammation of the pancreas there is usually an extreme persistent rigidity of the muscles of the upper abdomen. But when we remember how close the pancreas is to the cœliac plexus and the semilunar ganglia it should be easy to understand both the agony of pain and the muscular rigidity accompanying the disease, for the condition amounts to a strong and persisting stimulation of the splanchnics. Even in acute pancreatitis, however, the rigidity gives way to flaccidity as the condition progresses. When rigidity is due to irritation of the parietal peritoneum it is usually approximately limited to those muscles supplied by the nerves from the same segment as the one whose terminal nerves are irritated.

Parietal Irritation and Rigidity.

It is a very difficult problem to determine the exact amount of parietal irritation necessary to cause rigidity. In some patients this amount is quite slight, in others the abdominal wall is perfectly lax though there may be extensive parietal irritation. The difficulty depends on three factors—the variability of the reflex in normal persons, the fatigue of the neuro-muscular reflex, and the condition of the muscle. The first factor cannot be accurately estimated, but the second and third can be allowed for. If the severe pain and local symptoms have lasted for 24 hours, if the symptoms of toxæmia are extreme, then one must expect some fatigue of the reflex and lessening of the rigidity. Such a phenomenon is frequently witnessed in the case of a toxic patient with acute appendicitis, or in a person who comes to the surgeon

with a perforated gastric ulcer of 24 hours' duration. Sometimes the fatigue of the reflex appears to occur very suddenly. Certain it is that one meets many cases of diffuse peritonitis in a late stage in which there is no rigidity of the abdominal wall. The other reason for lack of abdominal rigidity is a weak, thin or fatty muscle which cannot become very rigid under any stimulus. It is often difficult to appraise the amount of parietal peritonitis subjacent to the abdominal wall of a fat subject, for three inches of fat is an efficient screen apart from the possible fatty degeneration of the muscle.

Muscular rigidity is only found in the active stage of parietal peritoneal inflammation. When the infection becomes localised the rigidity tends to diminish. It is the rule for a well-localised intraperitoneal abscess to have a lax abdominal wall over it. Peritonitis under the diaphragm leads to rigidity of that muscle which is demonstrated by want of movement on respiration. Peritonitis over the psoas may lead to rigidity of that muscle also, demonstrated by pain on extension of the leg. Irritation of the non-demonstrative area of the peritoneum does not lead to rigidity. This fact is of very great clinical importance. Peritonitis starting from the pelvis does not cause abdominal wall rigidity till the suprapubic region is involved, and not even then if the parietes be not much affected. The same absence of rigidity is sometimes seen in cases of ruptured intestine (or leakage of intestinal suture) if the leakage be amidst coils of intestine or against a silent area of the parietes. Lack of appreciation of this fact is, I feel sure, responsible for many serious mistakes. It is possible for extensive and fatal peritonitis to occur without there being any rigidity owing to the slight involvement of the demonstrative parietal areas.

6. ALTERATION OF MUSCULAR REFLEXES.

The alteration of the superficial abdominal reflexes in acute abdominal disease has been studied by Gwynne Williams,[9] who found that the reflexes were diminished in some abdominal conditions. I have not paid special attention to this point, but from the varying response obtained in normal persons I am not disposed to lay much stress on the importance of the reflexes in cases of peritonitis.

THE NERVE-SUPPLY OF HERNIAL SACS.

Hernial sacs are formed from parietal peritoneum bulged through or between the other structures in the parietes. It is interesting to endeavour to ascertain what nerves, if any, are found in connexion with such sacs. It is clear that any such nerves must be derived from the nerves which supply the neighbouring parts and as the sac grows in size, since it is very unlikely that the nerves will grow, the nerves would become more sparsely found in the sac-wall, until in time the sac and its coverings are almost devoid of nerves. Round the base or neck of the sac one would still expect to find nerves in greater number. This a priori view is borne out by the clinical experience that well-developed and large hernial sacs are very insensitive, whereas small sacs or herniæ in the making are much more painful. An inguinal hernia is naturally the most painful variety, as the tissues round the sac are well supplied by nerves. The ilio-inguinal nerve supplies fibres to the tissues of the cord and the ilio-hypogastric and genito-crural supply the neighbouring muscular fibres and tissues. An inguinal hernia is painful and tender in proportion to the rapidity of its formation and the acuteness of its strangulation. The irritation and stretching of the nerves in these peri-saccular tissues may cause acute hyperæsthesia of the skin over the hernia, for the skin is supplied by the same nerve. This is best seen in the strangulation which sometimes occurs the first time that a congenital sac is opened up in young adults. In long-standing cases strangulation may not be accompanied by hyperæsthesia.

Umbilical and femoral herniæ are less sensitive than inguinal, and strangulation is not accompanied by so much local tenderness. This is easily understood if one considers that in both cases the sac issues through fibrous rings which have poor nerve-supply, and that the sac itself has very few nerves. The clinical importance of this fact has long been known and taught, but the reason for lack of local pain has seldom been given.

CONCLUSION.

When a patient comes to the surgeon with symptoms of intestinal obstruction an almost painless femoral hernia often proves to be the source of the trouble. In such cases there is referred pain in the abdomen, but the local pain, though present, is so slight as to be overlooked by the patient. If a complete coil of gut be present in the sac there may be greater tenderness, but if only a knuckle of gut or omentum there may be little or insignificant pain. How seriously this may mislead I can best illustrate by a case. A patient was sent up to hospital ten years ago with the following note:—

"I am sending a patient whom I have been treating for intestinal obstruction for the last four or five days. She also has an umbilical hernia. This morning to my astonishment I noticed that the skin over the hernia was gangrenous so I send her up to you."

The woman had a large gangrenous mass of omentum in an umbilical hernia and was in a moribund condition. It is clearly necessary to issue a caution as to the insensibility of hernial sacs. The mortality of strangulated hernia remains so great that I fear the point is little realised.

References.

1. Mackenzie, Sir James: Symptoms and their Interpretation, 1909. (London: Shaw and Sons.)
2. Hilton, J.: Lectures on Rest and Pain.
3. Ferguson, John: Brain, vol. xiv., p. 282.
4. Kehr, H.: Surgery of the Biliary Passages, 1913.
5. Osler and Macrae's System of Medicine, vol. v.
6. Robson, A. W. Mayo: Brit. Med. Jour., 1899, ii., p. 1100.
7. Sherren, James: THE LANCET, 1903, ii., p. 816.
8. Head, Henry: Brit. Med. Jour., 1922, i., p. 2.
9. Williams, Gwynne: Brit. Journal of Surgery, vol. vii., p. 320.

DUODENAL REGURGITATION INTO THE STOMACH DURING GASTRIC DIGESTION.

BY CHARLES BOLTON, C.B.E., M.D., D.SC., F.R.C.P. LOND., F.R.S.,
PHYSICIAN TO UNIVERSITY COLLEGE HOSPITAL;
AND
GORDON W. GOODHART, M.A., M.B., B.C. CAMB.,
CLINICAL PATHOLOGIST TO UNIVERSITY COLLEGE HOSPITAL.

Historical.

IT is well recognised by physiologists that the regurgitation of intestinal digestive juices from the duodenum into the fasting stomach is an event of regular occurrence in animals. This phenomenon has also been directly observed in man, and more recently Rehfus and his collaborators, using the fractional method of gastric analysis introduced by him, have definitely established it to be an almost constant feature in the fasting human subject. Owing to the work of Boldyreff it is also known that HCl and fatty acids in the duodenum, by stimulating the secretion of pancreatic juice and the discharge of bile, bring about such a regurgitation after they themselves have been neutralised and the pylorus has therefore opened.

In a later communication Boldyreff (1915),[1] working with dogs, introduced mineral and organic acids of known strengths into the fasting stomach and found that their percentage of acidity was gradually reduced, as other workers have also observed. He found that this reduction of acidity was due to neutralisation in the stomach by the pancreatic juice and that it occurred to a fixed level of 0·15 to 0·2 per cent. HCl. He points out that of the alkaline fluids available the only efficient neutraliser is the pancreatic juice, which is about ten times the strength of the other fluids. He eliminated experimentally these alkaline secretions one by one, and found that the only method of preventing the reduction in the acidity of the gastric contents was ligature of the pancreatic duct. These experiments are conclusive in showing that the saliva,

bile, mucus, succus entericus, and pyloric juice all assist to some extent, but that they cannot efficiently replace the pancreatic juice in this function of neutralisation. The pancreatic secretion induced by high degrees of acidity is driven into the stomach by strong antiperistaltic waves due to irritation of the intestine, which cannot tolerate an acidity of more than 0·1 to 0·15 per cent. HCl. The most favourable strength of HCl to gastric digestion is 0·15 to 0·2 per cent. and the mechanism described above regulates the acidity to this strength. It is styled by him "the self-regulation of the acidity of the stomach contents." He also points out that the residual fluid may be bile-stained, although this is by no means always the case, as pancreatic juice alone may regurgitate.

In the year following Spencer, Myer, Rehfus, and Hawk (1916)[2] examined this question of duodenal regurgitation in man. As a test of the presence of pancreatic juice in the gastric contents, obtained by the fractional method, they employed the quantitative estimation of trypsin. They examined the contents of the fasting and of the digesting stomach for this ferment and also after administration of HCl, sodium bicarbonate, and water. They found that trypsin was almost constantly present in the fasting and also in the digesting stomach, that its amount varied inversely with the acidity of the gastric contents, and that it occurred not only with a high acidity but also when the gastric contents were alkaline. They regard their work as in many ways confirming the theory of Boldyreff, and adopt the view that duodenal regurgitation is a response to irritation of the duodenum, and part of an attempt to render harmless substances that would have an injurious effect upon the small intestine. In a later paper by Rehfus and Hawk (1921)[3] the contrast between duodenal regurgitation during the digestive phase and during the resting phase is emphasised. They state that during gastric digestion the pylorus shows heightened tonus with but little regurgitation, except that which is essential to maintain optimum acidity in the stomach, but that during the resting phase the pylorus relaxes, permitting a ready reflex of alkaline duodenal secretion.

This view is also held by Bennett and Ryle (1921).[4] They state that the percentage of acidity in the gastric contents is the resultant of several varying factors—acid on the one hand, alkaline on the other, the alkali being derived from saliva, duodenal regurgitation of intestinal contents, secretion of pyloric mucous membrane. They give diagrams to illustrate their meaning, showing that when the stomach is emptying there is not much duodenal regurgitation, but when the organ is emptied there is free regurgitation. Crohn (1918)[5] introduced HCl into the fasting stomach of a patient with achylia and found a rapid fall in the acidity, which he attributed to dilution with a secretion of watery juice containing no acid ions, and also to a secretion of alkaline mucus.

Observations.

It must be admitted that at the present time the views held with regard to duodenal regurgitation into the digesting stomach of the human subject are chiefly matters of surmise, as no exact observations have been made to determine when, and to what degree, the contents of the digesting stomach are neutralised by the regurgitation of pancreatic juice, or how the curve of gastric acidity is modified by such regurgitation. The object of our present series of observations is to elucidate these points. Using the fractional tube for extraction, and the gruel test meal, we have made a complete analysis of the gastric contents every quarter of an hour, estimating the total chlorides, the inorganic chlorides, and the active HCl. The estimations were made by the Volhard method, which has been in routine use at University College Hospital for many years, except that the gastric contents were not filtered before fusing. With the gruel meal the amount of solid material in the stomach contents is small, the chloride content being about 0·02 – 0·03 per cent. A number of experiments were made with the gruel meal itself, and also with the stomach contents an hour after taking the meal, both filtered and unfiltered material being used. The unfiltered material nearly always gave a slightly higher chloride figure than the filtered, but duplicate estimations of the unfiltered contents gave practically the same result in every case, and we are satisfied that no real error is encountered from this source. Estimations were also made of the free HCl and the total acidity, using dimethyl and phenolphthalein as indicators, in all cases in which the amount of available fluid was sufficient. These figures are not given in the charts as they were not obtained in all cases, and for the sake of simplicity; this method is very laborious and it is not claimed that it is of general applicability in clinical work; on the contrary, it is in our opinion only suitable for a purely scientific investigation of the events occurring during gastric digestion. The individuals used for these observations were three normal students, 13 cases of functional disturbance, in which there was no clear evidence of organic disease of the stomach, three gastric and two duodenal ulcers, one case of pernicious anæmia, and one gastric cancer.* We have found that duodenal regurgitation is not an intermittent leak into the digesting stomach in small amounts, but that at a definite point, as the stomach is emptying and the curve of acidity is rising, the pylorus relaxes and allows of a considerable reflux of intestinal juices, which rapidly brings down the acidity as the stomach empties and determines the form of the curve. Duodenal regurgitation is thus a definite link in the chain of events occurring during gastric digestion. The curve of acidity due to free HCl as obtained by the fractional method assumes in the vast majority of cases the form of a single peak, varying very considerably in the steepness of its rise and fall and in its height. Such curves occurred in 90 out of 100 normal students recently examined by Bennett and Ryle.[6] In the remaining nine cases there was either (1) no free HCl present at all, or (2) no descent to the curve, the percentage of acidity remaining at its highest level till the stomach was empty. Our observations are in agreement with these findings: we have also found that the curve of active HCl (free HCl + protein HCl) has a similar form.

It is quite clear that the rise in the curve is due to a continuous output of gastric juice, varying in rapidity in different cases. The fall in the curve must result from either neutralisation or dilution of the gastric contents or both, because if neither of these factors came into play the curve would gradually rise as the stomach emptied till the concentration of the gastric contents in HCl equalled that of pure gastric juice; whilst, if the secretion of gastric juice stopped at any moment, the curve would subsequently draw a horizontal straight line, the gastric contents maintaining a uniform acidity as the stomach emptied. The curve of the inorganic chlorides, however, demonstrates that the top of the peak in the acid curve corresponds with the time at which the pylorus definitely relaxes and allows considerable regurgitation of intestinal juices, because at that point as the acid curve begins to fall the curve of inorganic chlorides simultaneously rises and the two usually cross one another. The rise of the inorganic chloride curve is the result of neutralisation of the HCl. That the gastric contents are not materially diluted is shown by the fact that the curve of total chlorides remains at its original level.

The Curve of Active HCl (Free + Protein HCl).

The curve of active HCl follows very closely that of the total acidity as estimated by titration using phenolphthalein as the indicator, and various types are seen corresponding to those mentioned above as being the normal curves of free HCl.

Type 1.—This curve shows a steady rise until the summit is reached at a level corresponding to 0·16 to 0·23 per cent. HCl in rather under one and a half hours.

* Up to the date of publication we have examined by this method upwards of 70 cases, all confirming our conclusions.

This rise is parallel to and only a little below that in the curve of total chlorides and is obviously, as stated above, due to a rapid output of HCl by the gastric glands. Any residue which had been found in the fasting stomach before the feed was given was estimated and the reading recorded at the beginning of the curve, which gives the appearance of an initial fall in the curve. Having attained its summit the curve then shows either a short plateau followed by a fall or else an immediate fall. In either case the cessation of the rise is coincident with or immediately preceded by a rise in the curve of inorganic chlorides, an event which can only be adequately explained by rapid neutralisation of the HCl owing to a more or less sudden reflex of alkaline intestinal juices. This reflux occurs whilst starch is present in the stomach, but no definite relation appears to exist between the time at which it occurs and the subsequent time at which the stomach empties, as shown by the disappearance of starch from the gastric contents. The interval between these two events, the commencement of neutralisation and the emptying of the stomach, varied in our curves from half hour to three hours. Towards the end of the curve when the stomach is empty the fall may be accelerated by diminution in the secretion of HCl and by dilution by the regurgitated fluid, as shown by a fall in the curve of total chlorides, which may at this stage descend to a level equivalent to 0·2 per cent., the amount of chloride present in the pancreatic secretion.

It is clear that this curve of active HCl is no measure of the actual gastric secretion; it represents only the balance between the two processes, secretion and neutralisation. The work of Dodds[7] bears out this idea. He has shown that the curve of alveolar CO_2 closely corresponds with the curve of gastric acidity, the rise in the CO_2 curve being due to the output of acid from the blood, and the fall to the output of alkali in the form of pancreatic juice.

It is also important to realise that a stomach which gives a very low acid curve with no free HCl may yet give a total chloride curve equal to or even exceeding that of many normal stomachs. The fact that such curves also occur in patients who have had successful gastro-enterostomies performed and in whom the free regurgitation of duodenal contents through the stroma is the cause of the high total chloride and low acid curves, lends support to our view that duodenal regurgitation through the pylorus is similarly the cause of the fall in the active HCl curve which we describe, and of the low acid and high total chloride curves just mentioned. In illustration of this type of curve we quote eight (1–8) cases, and also three others (9–11), showing absence of free HCl with a low active HCl curve and a high total chloride curve.

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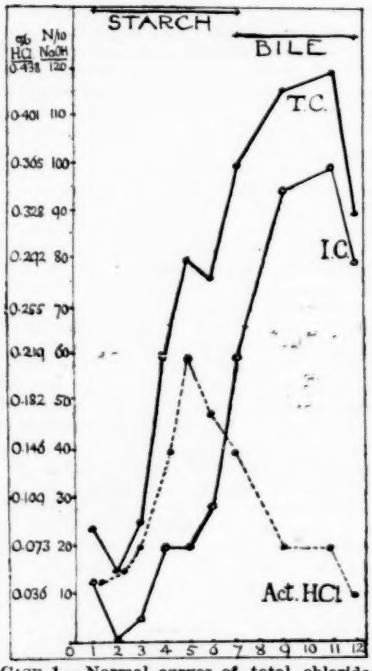

CASE 1.—Normal curves of total chloride (T.C.), inorganic chlorides (I.C.) and active HCl.

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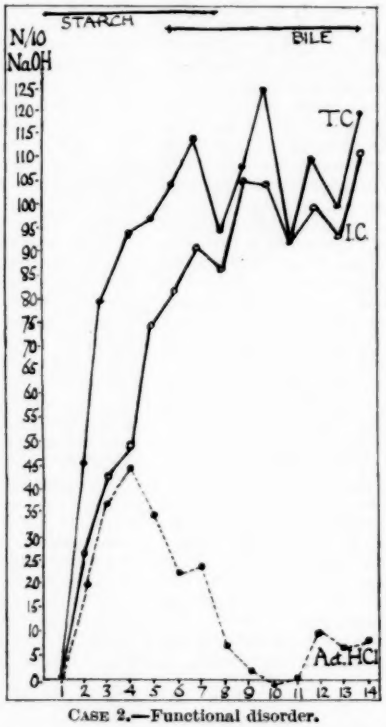
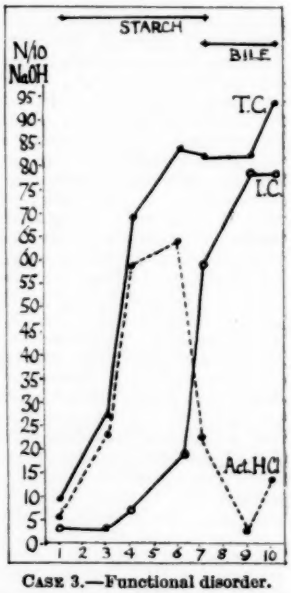


CASE 2.—Functional disorder.

3



CASE 3.—Functional disorder.

N.B.—In all the charts the percentages of HCl corresponding to the amounts of decinormal NaOH are omitted. The figures at the foot represent quarter hours.

CASE 1 (Fig. 1).—F. R. W., male, aged 27 years, a normal medical student.

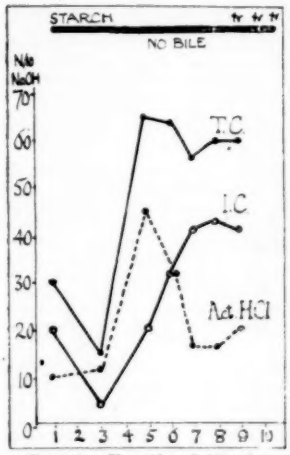
CASE 2 (Fig. 2).—F. B., female, aged 53 years, had suffered for nine years from irregular attacks of vomiting, which appeared to originate in the eructation of a clear fluid chiefly in the night, and also two hours after food. The fluid never contained food and was either tasteless or slightly bitter. The only other symptom was a feeling of fullness. For the last 18 months slight pain situated just above and to the left of the umbilicus had been superadded. It was of a dull pulling quality and occurred two hours after food, which relieved it. On examination patient was free from symptoms. By the X rays the stomach was orthotonic with active peristalsis, and emptied itself in three hours as near as possible. Diagnosis: Functional disorder.

CASE 3 (Fig. 3).—E. G., female, aged 33 years, had suffered from pain right across the abdomen and below the umbilicus for 14 years. For the last seven weeks she had had pain across the epigastrium and in the centre of the sternum more or less constant, but worse soon after meals. Vomiting also occurred after meals. There was fullness and eructation of wind but no fluid. By the X rays the stomach was long and narrow and situated considerably to the left. It was empty within two hours. Diagnosis: Functional disorder.

CASE 4.—A. B., female, aged 29 years, had had gastric attacks like the present one since 15 years of age. The onset of an attack was usually due to some indiscretion in diet. There was localised pain in the centre of the upper epigastrium with tenderness and some resistance. It occurred about 10 to 15 minutes after meals, was sharp, and radiated to the back and left shoulder. There was eructation of wind but no vomiting. She was a nervous individual and also

had pain in the right side, worse on lifting weights or at the periods. By the X rays the stomach was of normal shape and contained a small residue after three hours. Diagnosis: Functional disorder. (Analysis shows curves similar to Fig. 3.)

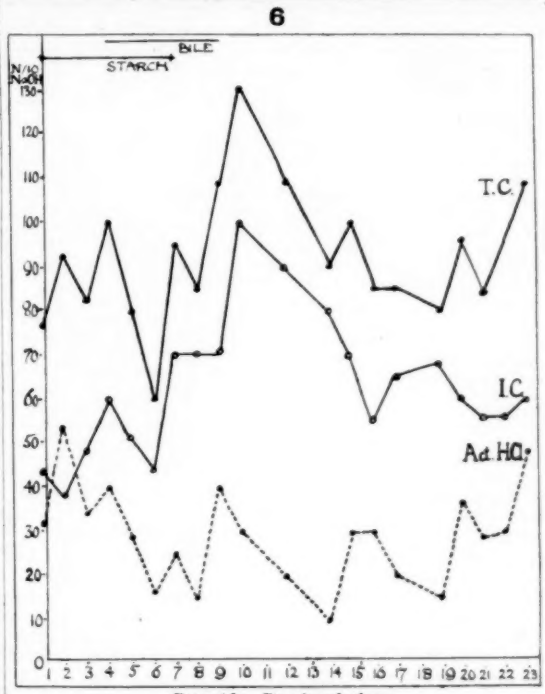
CASE 5 (Fig. 4).—A. W., male, aged 59 years, had suffered from occasional attacks of pain in the epigastrium just below the ensiform for ten years. This pain was dull and aching and came on one and a half to two hours after meals, which relieved it. He also suffered from fullness and loss of appetite for six months. He had lost some weight. There was no vomiting or bleeding. There were some decayed teeth and pyorrhœa in the lower jaw. There was rigidity of the left rectus and slight tenderness below the ensiform. X ray examination showed slight atony and a small residue after three hours. After a few days in hospital he had very little pain. He had his teeth extracted and left in a month quite well. Diagnosis: Functional disorder.



CASE 5.—Functional disorder.

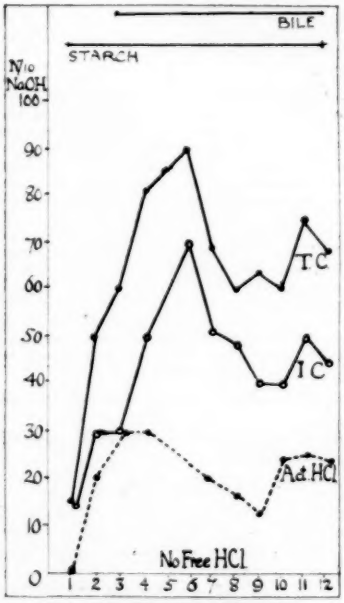
CASE 6.—B. N., male, aged 45 years, had had gastric pain since 1918. The pain extended across the epigastrium in a band and sometimes to the back. It was usually constantly present and relieved to some extent by food for two or three hours only. There was vomiting of a "slimy greenish material" and some loss of flesh. The patient suffered from aortic regurgitation and his Wassermann reaction was positive. By the X rays there was an appearance as of defective filling of the pyloric end of the stomach, the body being of a rotund shape; there was some residue at the end of three hours. Diagnosis: Functional disorder.

CASE 7.—A. G., female, aged 25 years, had suffered at intervals for a year from gastric attacks of the following nature. Four hours after her tea more especially, but also after other meals, a sharp shooting pain occurred in the left side of the chest below the breast, which lasted a short time and was succeeded by pain in the upper part of the epigastrium, which was dull and aching and lasted half an hour or till the next meal. This was followed by general coldness and shivering. There was also tightness in the chest, fullness, and eructation of wind with the pain, but no vomiting, although nausea was felt. The patient was thin. There was slight epigastric tenderness, but no rigidity. Diagnosis: Functional disorder.

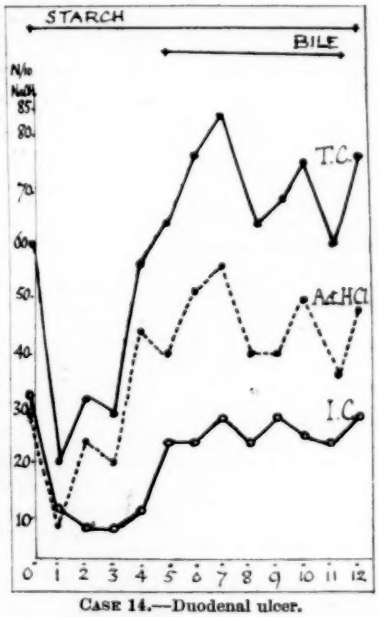


CASE 13.—Duodenal ulcer.

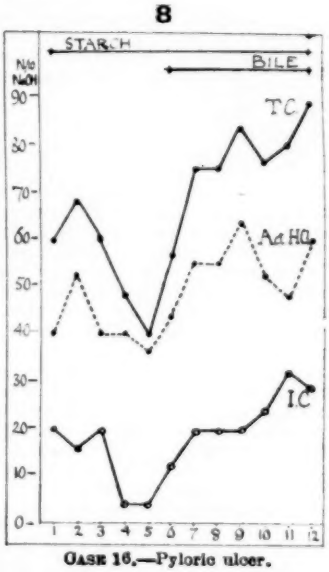
CASE 8.—T. P., male, aged 46 years, was suffering from aortic regurgitation. His illness commenced in 1916 and since this time he had had attacks of pain and vomiting, and on three occasions hæmatemesis. By the X rays there was food in the stomach after six hours. At the operation a pyloric ulcer was found. (Analyses of Cases 6, 7, and 8 show curves similar to preceding.)



CASE 10.—Functional disorder.



CASE 14.—Duodenal ulcer.



CASE 16.—Pyloric ulcer.

Low Acid and High Total Chloride Curve.

CASE 9.—W. C., male, aged 47 years, had suffered for a year from pain and vomiting. The pain was mid-epigastric, gnawing, and occurred half to one hour after food. Vomiting

occurred about one hour after the pain, which it slightly relieved. There was fullness, relieved by eructation of wind. Some loss of weight. By the X rays there was a small residue after three hours. The pain ceased in a few days and vomiting never occurred whilst under observation. Diagnosis: Functional disorder.

CASE 10 (Fig. 5).—J. L., male, aged 31 years, had been ill for seven months. The pain was just above and to the right of the umbilicus; it came on three hours after meals and lasted about half an hour when it was relieved by eructating wind, but if not the next meal relieved it. It did not wake him at night. There was no vomiting or loss of weight; no bleeding. By the X rays the stomach was empty in three hours. He only had pain on three occasions whilst under observation. Diagnosis: Functional disorder.

CASE 11.—L. H., male, aged 40 years, had been ill for 18 months with occasional eructation of bitter fluid a few minutes after meals. For six months he had had an aching pain a few minutes after meals, in the epigastrium, behind the sternum, and a feeling of a lump in the throat. There were fullness and bitter eructations leading to vomiting. These symptoms came on three or four times a week chiefly after the evening meal, and on rising in the morning there were often bitter eructations. By the X rays there was a small residue in the stomach after six hours. There was slight loss of flesh, but the patient was healthy-looking and in good condition. Diagnosis: Functional disturbance. (Curves of Cases 9 and 11 are similar to Fig. 5.)

Type 2.—Sometimes the curve above described is varied by a subsequent rise occurring at about the third hour or later, when the stomach has emptied. This rise is coincident with a sharp fall in the curve of inorganic chlorides and sometimes by a rise in the curve of total chlorides. In all such cases which we have examined the stomach has emptied early, but has contained a free secretion in the interdigestive phase and the last rise has been accompanied by the disappearance of bile. This rise in the curve we believe to be due to a cessation of duodenal regurgitation due to hypertension of the pylorus. The HCl at this period is almost entirely free. We quote two cases in illustration of this type of curve (12 and 13).

CASE 12.—A. H., male, aged 31 years, had had attacks of pain since 1919 lasting five to six weeks, with free intervals of 5–13 months. There was a heavy pain in the front of the chest and epigastrium half an hour after meals temporarily relieved by food. Vomiting occurred three hours after food, consisted of bitter fluid, and temporarily relieved the pain; the vomit never contained blood. An X ray examination showed an orthotonic stomach, almost empty in three hours. Diagnosis: Functional disorder. (Curve similar to Fig. 6.)

CASE 13 (Fig. 6).—M. M., male, was operated on and a duodenal ulcer found. The X ray examination showed a low orthotonic stomach and a low colon. At the end of three hours there was considerable food residue.

Type 3.—A third type of curve corresponds to the "climbing type" of free HCl curve described by other observers. Here the curve of active HCl begins more or less slowly, climbs steadily, and remains high for at least three hours. This type is seen in a variety of clinical conditions, the one factor common to all being defective duodenal regurgitation due to organic obstruction of the pylorus, or spasm or deficient relaxation of the sphincter pylori. In these cases the total HCl secreted may be normal or increased, but the inorganic chlorides remain low owing to defective neutralisation. This type of curve we also obtained in a case of hour-glass contraction in which the material examined was obtained only from the upper sac. In some cases the curve of active HCl shows one or more dips corresponding to slight rises in the inorganic chloride curve, no doubt due to a partial relaxation of the pylorus with only slight regurgitation (Cases 19 and 20). Sooner or later, however, unless there is an organic stricture of the pylorus, the sphincter relaxes and neutralisation occurs.

The following eight cases (14 to 21) illustrate this type.

CASE 14 (Fig. 7).—W. H., male aged 54 years, had been ill for 20 years with attacks of pain lasting a few weeks to a year. The pain was dull and aching, occurred two to three hours after meals, was situated in the mid-epigastrium, passing to the back and right shoulder and was relieved by food. Vomiting commenced three years ago and relieved the pain, the vomited matter containing coffee-grounds material on one occasion 10 years ago. There was fullness and eructation of wind. By the X rays the stomach was found to be dilated and atonic, and after six hours about one-third of the contents still remained. The patient was operated on and a duodenal ulcer found.

CASE 15.—H. T., male, aged 46 years, had had attacks of pain for 15 years with intervals as long as 18 months. The pain occurred over the whole abdomen, but was most intense in the upper zone. It was dull and heavy and had no relation to meals, although occasionally it was relieved by food. Vomiting occasionally occurred. The patient was thin and had a few bad teeth. A test-meal of meat showed: Active HCl 0·31, free HCl 0·25, total acidity 0·45, total Cl 0·41, and inorganic Cl 0·1 per cent. The teeth were extracted and patient rapidly lost his symptoms. Diagnosis: Functional disorder. (Curve similar to Fig. 7.)

CASE 16 (Fig. 8).—O. T., male, aged 54 years, had suffered from attacks of a dull aching pain situated just below the ensiform. It came on about 3 P.M. and was relieved by vomiting or eructating wind. Fullness and discomfort appeared a few hours after breakfast and got worse towards evening. If he starved he suffered no discomfort. Eructations of wind and fluid caused a scalding sensation in the throat. The vomit was watery and sour, but never contained blood, the vomiting usually occurring towards evening or in the early morning. The patient was operated on and a pyloric ulcer found.

CASE 17.—W. S., female, aged 29 years, had exophthalmic goitre two years ago but now simply had slight staring of the eyes. For seven years she had been subject to pain and vomiting. The pain affected the left hypochondrium and epigastric region spreading to the right. It was not related to food, but might be slightly relieved by the latter. It might last only an hour or be continuous all day and was dull and aching, sometimes stabbing. It was increased by working. The vomiting was very irregular and the vomit consisted of food and a slimy material and relieved the pain. There was fullness soon after meals, but no eructations. The appetite was bad and the bowels constipated. She had lost flesh during the last five years. The X ray examination showed gastroptosis and an atonic stomach, with considerable residue after six hours. Diagnosis: Functional disorder. (Curve similar to Fig. 7.)

CASE 18 (Fig. 9).—S. S., male, aged 42 years, had had indigestion since childhood. This became worse five years ago with almost constant pain and irregular vomiting, the vomit on one occasion being of the coffee-grounds type. By the X rays the stomach was dilated and atonic and at the end of six hours the shadow had not diminished much in size. At the operation pyloric obstruction due to a chronic ulcer was found.

CASE 19 (Fig. 10).—A. S., female, aged 39 years, had been ill since 1917. She complained of a heavy dull pain at the level of the third costal cartilage passing to the back and causing a sensation of choking in the throat. It often came on half an hour after waking and then lasted all day, and she had been awakened at night by it. Food has no effect on the pain, although at the beginning she had had epigastric pain half an hour after food. This had now disappeared. For the last four months she had had attacks of swelling of the face, evidently urticarial. There was abundant gaseous eructation but no vomiting. The only physical sign was slight epigastric tenderness. By the X rays the stomach was orthotonic with active peristalsis, the lower pole being lower than normal. After five hours there was still a small residue at the pyloric end. The pyloric cap was normal. The patient was operated upon and the stomach found to be normal. Diagnosis: Functional disorder.

CASE 20 (Fig. 11).—O. B. L., male, aged 25 years, a normal medical student.

CASE 21.—S. E., female, aged 29 years, a normal medical student. (Curve similar to Fig. 7.)

Curve of Inorganic Chlorides.

The curve of inorganic chlorides varies in each of the types of curve of active HCl described above and a reference to the illustrations of these cases will elucidate the following points.

In Type 1.—The curve of inorganic chlorides gradually rises from the beginning with that of the active HCl to more or less the same level. This rise is due to neutralisation of some of the HCl secreted by what alkali happens to be present in the food, or swallowed in the saliva, or contained in the gastric mucus or pyloric juice; it is also due to decomposition of organic salts in the food by the HCl. At the point at which the curve of active HCl falls, the curve of

inorganic chlorides continues to rise sharply following that of the total chlorides at a somewhat lower level. This second rise is due to neutralisation of the HCl by regurgitated duodenal juices.

In the three curves of low acid readings (9, 10, 11), it will be observed that the curve of inorganic chlorides closely follows that of the total chlorides all the time. In these cases we believe that duodenal regurgitation is active almost from the beginning, owing to deficient pyloric tone. Similar curves due to free regurgitation of duodenal contents are obtained after successful gastro-enterostomies. In the almost complete absence of HCl secretion both the inorganic chloride and total chloride curves are low, as in the following two cases:—

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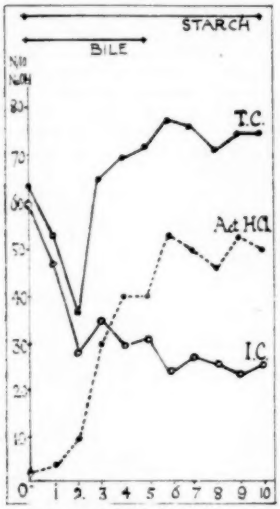


CASE 18.—Pyloric ulcer.

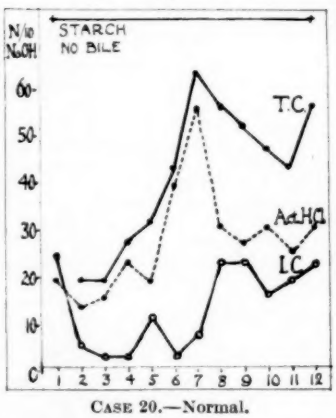
CASE 22 (Fig. 12).—A. E., cancer of the stomach.

CASE 23.—G. B., pernicious anæmia. (Curve similar to Fig. 12.)

In Type 2.—The curve of inorganic chlorides follows the same course as in the previous type, but later when the acid curve rises it coincidently falls, owing to dilution by the freshly secreted gastric juice.

In Type 3.—In the "climbing type" of HCl curve, the curve of inorganic chlorides remains uniformly low owing to the absence of duodenal regurgitation and consequently defective neutralisation. In some cases, however, the curve of inorganic chlorides may show irregular rises corresponding with depressions in the active HCl curve. This suggests neutralisation by duodenal regurgitation, insufficient to bring down the acid curve, and no doubt due to a partial relaxation of the pylorus with only slight regurgitation of intestinal contents.

11



CASE 20.—Normal.

Curve of Total Chlorides.

The hydrochloric acid secreted is composed of the free HCl, the protein HCl, and the neutralised HCl, which latter constitutes a portion of the inorganic chlorides. Neither the acid curve nor the inorganic chloride curve therefore represents the secretory curve of the gastric juice. The latter is most nearly represented by the curve of total chlorides, which maintains a more or less constant shape of various heights in all curves. When this curve rises the stomach is secreting, and when it falls the gastric contents are diluted by a fluid containing less chloride than is present in these contents.

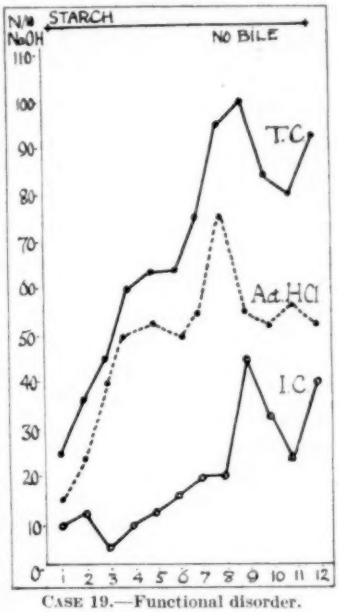
Conclusions.

1. Duodenal regurgitation occurs at a definite period, but not always at the same time, during gastric digestion, and must be considered as a definite link in the chain of events occurring in the digesting stomach.

2. It determines the shape of the curves of hydrochloric acid and of inorganic chlorides, the former rapidly falling and the latter rising.

3. This regurgitation depends upon relaxation of the pyloric sphincter; and its presence or absence, as determined by the shape of the curves above mentioned, is a measure of the degree of tone or spasm of this sphincter, or of obstruction of the pyloric orifice.

10



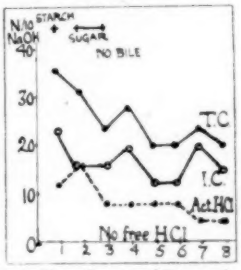
CASE 19.—Functional disorder.

4. The curve of gastric secretion follows closely that of the total chlorides, but at a somewhat lower level.

5. The absence of free HCl or the presence of a low active HCl curve are no indications, when taken alone, that the gastric secretion is correspondingly diminished, for the total chlorides may still be at the normal height; these cases are due to free duodenal regurgitation and are similar to those of successful gastro-enterostomy cases.

6. A curve of the "climbing type" does not necessarily indicate hypersecretion, but rather a delayed and deficient pyloric relaxation. Hypersecretion during the digestive phase is indicated by a rapid and high rise in the total chloride curve in the early part of that period; and during the interdigestive phase by the presence of an excessive amount of residual fluid containing a high percentage of total chlorides.

12



CASE 22.—Cancer of Stomach.

7. The two great factors contributing to the form of these curves are: (*a*) varying degrees of pyloric relaxation occurring at varying times, and (*b*) hypersecretion. The part played by deficient or excessive pancreatic secretion remains an open question.

8. The curves of free HCl and total acidity at present in use show, in most cases, the general shape of the curves we have described in this paper, more particularly when the acidity is high; but they fail in this respect when free HCl is absent.

We wish to thank the Medical Unit of the Hospital for certain facilities granted us.

References.

1. Boldyreff: Quart. Jour. of Exp. Phys., 1915, viii., 1.
2. Spencer, Myer, Rehfus, and Hawk: Amer. Jour. Phys., 1916, xxxix., 459.
3. Rehfus and Hawk: Jour. Amer. Med. Assoc., 1921, Feb. 26th, 564.
4. Bennett and Ryle: Guy's Hospital Reports, 1921, vol. lxxi. (vol. i., fourth series), No. 3.
5. Crohn: Amer. Jour. Med. Sci., 1918, clvi., 656.
6. Bennett and Ryle: Loc. cit.
7. Dodds: Jour. of Phys., 1921, liv., Nos. 5 and 6, 342.

THE INFANTILE MORTALITIES OF RICH AND POOR.

BY DUNCAN FORBES, M.D. EDIN., D.P.H. CAMB.,
MEDICAL OFFICER OF HEALTH, BRIGHTON.

A COMPARISON between the infantile mortalities of different classes of society throws some light on the directions in which further efforts may be most usefully made in maternity and child welfare work. Unfortunately, the necessary figures are not easily obtained, as the wards of our towns contain mixed populations; for the purposes of this paper it has therefore been necessary to group the streets of Brighton. The streets in Group (1) house the poorest families, in (2) unskilled workers, in (3) artisans and clerks, in (4) traders and business men, the well-to-do. The income and rents are progressively higher in each group from (1) to (4). A fifth group is made up of the illegitimate births from all the other groups. The statistics cover 20 years (1901–1920) and include 50,877 births. They are as follows:—

Table of Comparative Infantile Mortality in Brighton.

—	Illegitimate.	(1) Poorest.	(2) Unskilled workers.	(3) Artisans	(4) Well-to-do.	Totals.
Total births ..	3767	7910	18,025	16,123	5052	50,877
Infantile mortality in—						
1st week	27·1	18·7	22·2	24·0	19·4	22·3
1st month	48·0	35·1	34·9	36·1	27·7	35·6
1st year..	170·0	133·0	103·0	87·0	60·0	103·0

Mortality in the First Week of Life.

From figures in the table it would appear that, apart from the illegitimate group, the chances of survival of infants to the end of the first week are about equal in the various groups, some small advantage being with the children of the poorest.

Mortality in the First Month of Life.

It is generally accepted that infant life is most sensitive to insanitary surroundings and poor social conditions, yet even at the end of the first month there is little difference in the mortalities of the "poorest," "unskilled," and "artisan" groups, the "well-to-do" being the only class which shows a comparatively large reduction. These figures go some way to prove that newly born infants, whatever the sanitary and social conditions in which their mothers lived during pregnancy, given equally favourable conditions after birth, have an equal chance of survival.

I trust that no false deductions will be based on this statement, and think it well to point out that any evidence that the health of the infant is little affected by bad antenatal conditions has nothing to do with the effect of these conditions on the health of the mother.

Mortality in the First Year.

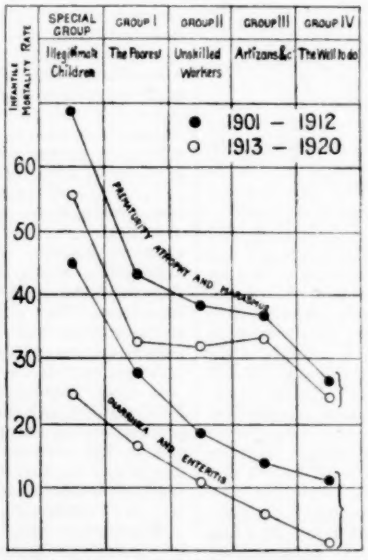
All medical officers of health know the great difference between the mortalities of legitimate and illegitimate infants, but they usually have no definite data to show the differences between the infantile mortalities of the richer and poorer classes. The figures in the table above are therefore worthy of study. Compared with the infantile mortality for the well-to-do taken as 100, that for the artisan class is roughly 145, for the unskilled 170, for the poorest 220, for the illegitimate 280. The figures for recent years (1912–1920) give even more striking results. Again, taking the infantile mortality for the well-to-do as 100, the others are as follows: artisan 170, unskilled 185, the poorest 230, the illegitimate 300. A reasonable deduction is that if, as the figures for the first week and first month seem to show, infants of the various classes have equal chances of survival at birth, then by giving the infants of the poorer classes as favourable surroundings as the infants of the well-to-do we can reduce the number of deaths amongst infants of the artisan group by one-third, of the unskilled by nearly half, of the poorest by more than half, and of the illegitimate by two-thirds (Diagram 2).

The comparative results of work directed against infantile mortality are apparent from a study of the charts, which show infantile mortalities in two periods —1901–1912 and 1913–1920, both inclusive.

Diarrhœa and Enteritis Curves (Diagram 1).—In the last 20 years the greatest fall, and a fall affecting equally all classes, has occurred in the diarrhœal group of diseases. The steepness of the curve from poor to rich for the later period shows that much more remains to be done. The continued fall, and the figures of diarrhœal mortality in the artisan, unskilled, and poorest classes being twice, four times, and seven times (striking figures) the mortality amongst the well-to-do, lead us to hope for a still further marked fall.

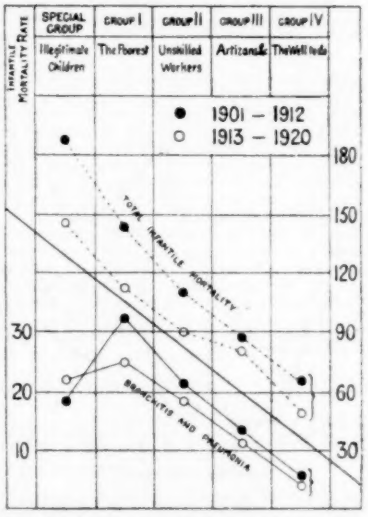
Prematurity, Marasmus, and Atrophy Group Curves (Diagram 1).—These curves show the second largest reduction. It is evident that improvement is possible, but the high figure which persists in the well-to-do group (24·2) and our failure to reduce materially the deaths in the first week of life point to this being the hardest group in which to effect reductions.

DIAGRAM 1.



Mortality from prematurity, marasmus, and atrophy, and from diarrhœa and enteritis.

DIAGRAM 2.



Total infantile mortality and bronchitis and pneumonia mortality.

Bronchitis and Pneumonia Curves (Diagram 2).—These curves are peculiar in so far as they show lower mortalities amongst the illegitimate than the very poor. This may be due to the better housing of the illegitimate. Only a slight improvement can be recorded in this group, which is disappointing, as the differences in mortality between the well-to-do and

the poorest are greater from respiratory than from any other group of diseases: 5·4, 12·3, 19·5, 25·6.

Summary of Conclusions.

1. The chances of survival of the newly born infant are not materially influenced by the social and sanitary conditions under which the mother lives during pregnancy, and given equally favourable surroundings the infants of the various classes have equal chances of survival after birth.
2. The mortality amongst the infants of the rich in the first year of life is less than one-half of the mortality amongst the infants of the very poor.
3. The fall in infantile mortality from diarrhœa is likely to continue. In the poorest it is seven times greater than in the well-to-do.
4. New methods are required to reduce, if possible, the mortality of the first week of life.
5. The infantile mortality rate from bronchitis and pneumonia is five times as great in the poorest as in the well-to-do. It may be that better housing of the former would reduce the difference.

SHORTENING OF POST-OPERATIVE CONVALESCENCE:

SOME DIFFERENCES BETWEEN BRITISH AND CONTINENTAL TREATMENT.

BY H. ETHELBERTA CLAREMONT, F.R.C.S. ENG.

A year's work on the Continent has convinced me that the routine practice of confining patients to bed for a prolonged period after operation is entirely unnecessary, and is in fact even harmful. In the Universitätsklinik of Prof. Paul Clairmont in Zürich, a method of post-operative treatment is carried out that would, at first sight, horrify an individual brought up on English lines, but a closer acquaintance reveals reason behind the apparent madness, and an examination of the results leaves no doubt as to the soundness of the method. Although this method is applied to the after-treatment of operations on all parts of the body, I will confine my remarks to abdominal operations, as it is in these cases that the majority of authorities in this country cling to the old belief that prolonged rest is necessary to ensure healing and unimpaired function of the parts involved.

Routine Treatment at Zürich.

The whole system in Zürich is concentrated on getting the patient out of bed at the earliest possible moment after the operation. It is recognised that the mere fact of lying in bed for any considerable number of days produces in itself an illness, both mentally and physically, even in a normal individual, without any such complication as the addition of an operation. The mentality of the patient becomes impaired by the monotony of the existence, and by the complete dependence on others, while on the physical side degeneration of function rapidly follows on the wasting of muscle and the disturbance of intestinal and other activities.

In the absence of any contra-indication such as fever, or the insertion of a drain, the routine practice in Zürich is to seat the patient out of bed in a chair for half an hour on the day following the operation. If the operation is performed in the morning the patient is often made to sit up on the same evening; on the second day he walks the length of the room and sits out for a longer period, or it may be for a short period twice a day. Thereafter the daily distance walked and the length of time out of bed are increased. When Michel's clips are used, they are removed as usual on the fifth day; stitches come out on the sixth to seventh day, and the patient walks out of hospital on the tenth day.

This method is applied only to those cases in which the abdominal cavity is primarily closed, but it is employed irrespective of the size of the operation wound, or of the nature of the operation. I employed it in all my own abdominal cases, and it was employed throughout the klinik as a matter of course for all uncomplicated appendicectomies, gastrostomies, gastro-enterostomies, &c.; while even extensive operations, such as resection of a portion of the stomach or of the intestine, proved to be no contra-indication to the use of the method. I have seen cases with large laparotomy wounds extending almost the whole length of the abdominal wall submitted to it without any ill-effects. In the whole year that I was working in the klinik I saw no case of ventral hernia occurring after this treatment. The only cases of post-operative hernia that I saw occurred in wounds that had been previously drained, or that had for some reason suppurated; and usually those cases had not been treated by the early sitting up method.

It is hardly necessary to say that cases complicated by fever, or primarily drained, are kept in bed until the fever subsides or the drain is removed. The upright position tends either to extrude the drain or to kink it. It appears to be a fallacy that early movement after operation causes non-union in the wound; in fact, experience shows the reverse to be the case. The improvement in the general condition of the patient and in the blood-supply to the part tends to make the occurrence of post-operative hernia decidedly rare. I must mention that in the Zürich Klinik the technique of suture of abdominal wounds is very thorough. With the exception of the peritoneum all layers are sutured with *very closely placed interrupted* stitches, catgut being the material usually employed. Continuous silk is sometimes used for the peritoneum, but thread is never used. How much bearing the use of thickly inserted interrupted sutures has on the prevention of ventral hernia, as opposed to continuous sutures, I am not prepared to say. I followed the technique adopted by the klinik in all my own cases, and was entirely satisfied with the results.

Post-operative Shock.

It may be asked what bearing post-operative shock has on the early movement treatment. Obviously, a patient suffering from shock cannot sit out of bed. My answer is that in Zürich I was amazed at the very slight degree of shock seen after the majority of operations. Even allowing for the very great length of time taken by most operations, owing to the very exact and precise technique used, the shock produced was a minimum, and was not, as a rule, sufficient to prevent the patient from sitting out of bed on the following day. It was, in my opinion, considerably less than that usually produced by the large operations as performed in this country.

We are then faced with the question as to the reason for this decrease in the post-operative shock. I think two factors play a part. The first is the fact that in the Zürich Klinik *pre-operative purging* is entirely unknown. The patient comes into hospital a few days prior to operation, and the bowels are regulated, but otherwise no attempt is made to purge, even for large operations on the intestines. According to years of experience and to all recent work on shock, the great method of treatment of this condition is to get fluid into the body by any and every route possible as rapidly as possible. It is, then, only rational to maintain that, as a preventive measure to the production of shock, the fluids of the body should be conserved, and even increased prior to operation, rather than decreased in such a drastic manner as that caused by purging. The second factor is the employment of local anæsthesia. For abdominal work, local anæsthesia is, in Zürich, employed in all cases in which acute inflammatory processes are absent, and where but little pulling on the parietal peritoneum is anticipated. I have myself used it for all cases of gastrostomy, gastro-enterostomy, and colostomy, and it is often employed combined with splanchnic or paravertebral anæsthesia for partial gastrectomy, cholecystectomy and other large operations. Even when the anæsthesia is not sufficient to complete the operation, and, as often occurs, a "general" has to be given during the time that the

peritoneum is being put on tension, the "local" is always sufficient to enable the surgeon to open the abdominal cavity, and the amount of "general" necessary during the later stages is very small. According to Crile's work, the local anæsthetic plays an important part in reducing shock, by cutting off the afferent nervous impulses to the brain.

It is, of course, difficult to estimate how much these different points of technique influence the possibility of early movement of patients after operation. I can only say, that, judging from my experience and observations in the Zürich Klinik, the result of these combined methods is to restore the patient far sooner to his normal life and independence, and to cause considerably less suffering from post-operative effects, than is too often the case with English methods. Several patients, who were in fact medical students, came under my personal notice, both at the time of operation and for many months after. They were operated on as emergency operations for acute appendicitis, the wound in each case being sutured. They left the hospital in ten days' time, and returned immediately to their medical studies. They expressed themselves as feeling perfectly well, within 14 days were riding about on bicycles, and within three months were undertaking strenuous mountain climbing. I accompanied one of them on one occasion, and can vouch that she was not in any way handicapped by her operation. They were all in good condition before the operation.

Conclusion.

No absolute rule can, of course, be laid down for post-operative treatment. Each case must be treated according to the circumstances and nature of the operation, and some patients who actually need the rest must be given a longer time after the operation—although I would like to throw out the suggestion that patients who are already run down, and to whom the operation is not an urgent matter, should be sent away to recuperate *before* rather than *after* the operation, thereby increasing the chance of benefit accruing from it, and diminishing post-operative convalescence. I might add that I witnessed similar post-operative methods in the clinic of Prof. von Eiselsberg in Vienna, and in those of Prof. Enderlin in Heidelberg and Prof. Schmieden in Frankfort, and all the many surgeons with whom I talked expressed themselves as strongly in favour of such methods.

TWILIGHT SLEEP:

NOTES ON 75 CASES.

BY H. M. GERSON, M.R.C.S.

THE following notes are a résumé of my experiences in 75 cases conducted under twilight sleep from May to December, 1920. Records were kept of every symptom and sign, dosages being charted at the time given. Where possible, and when patients were seen early enough, pelvimetry was carried out and the usual antenatal procedures were adopted. No case was advised against treatment on medical grounds though many might have been considered to hold out contra-indications by advanced pulmonary tuberculosis, heart disease, &c. The methods of Prof. B. Krönig and Prof. C. J. Gauss were used as a basis for mine, and additional details and variations gleaned from practical experience may be worthy of record.

Technique.—I was informed immediately labour set in, and abdominal examination only was made; the patient was told that her pains would increase in intensity and she was asked to call so soon as they became actually uncomfortable. When the patient was of nervous temperament I relied upon the regularity and intervals of pain (7 minutes) rather than dilatation of the os, and commenced treatment without any vaginal examination. In the case of multiparæ I commenced treatment as soon as labour definitely set in, always making quite certain that the pains were those of labour and never relying upon the nurse or patient for such information. Before giving the first injection—viz., 1/150 gr. scopolamine and 1/3 gr. morphine, made up in a single ampoule, the bedroom was arranged, windows opened, but light excluded, all swabs, instruments, dressings, &c., were removed from the room only to be brought in when the patient was narcotised. Dexterity in giving the first injection was an important factor in gaining the confidence essential while the patient was in the conscious state, and was followed by a remark to the effect that the only painful part of the treatment was now over. A second injection of 1/150 gr. scopolamine alone was given in one hour's time and true amnesia was not obtained until a further three-quarters of an hour had elapsed; in certain cases this period was even longer. Further dosages were as in typical cases described below.

The True State of Amnesia.—This state can be recognised by means of memory tests, such as those generally practised by the Freiburg School—viz., showing the patient familiar objects, asking her to recognise them later, her inability to do so being a criterion of the degree of amnesia. In my experience, however, these proved not only unnecessary but disturbing to the patient; after treating a certain number of cases the recognition of this state became almost instinctive. As will be gathered from the statistics below, the percentage of complete amnesia in primiparæ is very high in comparison with multiparæ, owing to the fact that the latter were seen too late in labour for the action of the drug to be effective. The figures for incomplete amnesia refer to those cases where the patient emerged from the narcotic state sufficiently to be conscious of her surroundings. This emergence indicated the repetition of morphine (gr. $\frac{1}{4}$) whereby complete amnesia was reinstated but at the sacrifice of a certain amount of intensity of uterine contraction. This in its turn was regained by small doses of pituitary extract. On the day after the delivery I confirmed my observations by interrogating the patient; her recollections of trivial incidents were found to coincide with the time of incomplete amnesia. Analgesia was always complete, irrespective of the degree of amnesia.

Use of Forceps.—Forceps have been applied in many cases owing to delay late in the second stage. There is no doubt that the action of the drug in several cases lessened the force of uterine contraction to such a degree as to necessitate the employment of the following methods: Stimulation of the uterus by abdominal massage and pressure; putting on a binder; emptying the bladder; giving enemata; making vaginal examinations; retracting the perineum manually. If these methods failed to intensify uterine contraction I gave small doses of pituitary extract (0·5 to 1 c.cm.).

Effect of Treatment on the Child.—One of the main objections to this method of delivery would seem to lie in the condition of the child at birth. Oligopnœa, in my experience, seems to occur more frequently than in unaided labour, although in none of my cases of infant mortality can I attribute death to this cause. I undoubtedly found it advisable in every case to exercise a certain amount of vigilance until the child gave a healthy prolonged cry. In eight cases I found it necessary to resort—each time successfully—to artificial respiration. I found that oligopnœa occurred more frequently in labours of short duration when delivery took place shortly after an early injection. Regarding the after-effect upon and mentality of the child I have very little to remark except that in following up my cases I found the mortality in the first year nil, and the mentality, as far as could be judged, normal.

Hæmorrhage.—In no case was any appreciable alteration found in the amount of hæmorrhage. In one case the patient voluntarily informed me that she was impressed with the diminished amount of hæmorrhage as compared with her former and ordinary confinement.

Puerperium.—In no case was there any complication, and every case was allowed to get up on the tenth day

with no untoward result. Many a patient undertook a long journey on the fourteenth to seventeenth day.

Dosages Recorded in Two Typical Primiparæ (Cases 16 and 17).—Labour occurred simultaneously in these cases. Pains commenced six hours before first injection. Os in each case 2/5ths; pains regular, five minutes' intervals.

Injection.	Case 16. Time of Injection.	Case 17. Time of Injection.
1. 1/3 gr. morph., 1/150 gr. scop.	5 A.M.	5.30 A.M.
2. ,, ,,	6.10 ,,	6.15 ,,
3. ,, ,,	8.55 ,,	8.40 ,,
4. 1/4 gr. morph. ,, ,,	11.55 ,,	11.15 ,,
5. 1/450 ,,	12.25 P.M.	12.20 P.M.
6. ,, ,,	1.35 ,,	1.30 ,,
7. ,, ,,	2.45 ,,	2.40 ,,
Birth	3.30 ,,	3.35 ,,

Morph. = Morphine. Scop. = Scopolamine.

Dosages Recorded in a Typical Multipara (Case 56).—Labour commenced 3½ hours before first injection. Os 1/5th, pains regular, seven minutes' intervals.

Case 56.

Injection.	Time of Injection.
1. 1/3 gr. morph., 1/150 gr. scop. ..	3.30 A.M.
2. 1/4 gr. ,, ,, ..	4.15 ,,
3. ,, scop.* ..	7 ,,
4. ,, ,,	10 ,,
5. ,, ,,	12.55 P.M.
Birth	2.40 ,,

* +1 c.cm. pituitary extract.

Special Case of Induction of Labour under Twilight Sleep.—Primipara, aged 33, urine 100 per cent. albumin; general œdema, labiæ especially so swollen as to suggest danger of obstruction.

Injection.	Time of Injection.	Methods of Induction.
1. 1/3 gr. morph., 1/150 gr. scop.	9.5 P.M.	—
2. ,, ,,	10 ,,	—
3.	12 ,,	Whiff of chloroform, vagina packed with gauze. T binder put on.
4.	8.45 A.M.	Chloroform, os dilated with fingers until 2/5ths.
5. 0·5 c.cm. pituitary ext. ..	10.30 ,,	Whiff of chloroform and de Ribes bag inserted.
6. 0·5 c.cm. pituitary ext. ..	10.40 ,,	
7.	12.5 P.M.	Bag re-inserted owing to leakage. Os now 4/5ths.
8. 0·5 c.cm. pituitary ext. ..	12.30 P.M.	Manual dilatation.
9. 1/450 gr. scop.	1.30 ,,	—
	2 ,,	Forceps applied. Female child delivered, 6 lb. 7 oz., stillborn.

Patient made good recovery, œdema subsiding and urine clear again three weeks following delivery.

Statistics of 75 Cases Delivered under Twilight Sleep.

	Primiparæ.	Multiparæ.
Number of cases	48	27
Maternal mortality	Nil	Nil
Infant mortality	2	1
Average duration of labour ..	20½ hours	13 hours
Average duration of twilight sleep ..	11⅓ ,,	7¼ ,,
Average period of labour before first injection	9¼ ,,	5¾ ,,
Average number of injections ..	6	4·2
Maximum ,, ,, ..	12	10
Minimum ,, ,, ..	2	2
Complete amnesia	45	18
Incomplete amnesia	3	8
Amnesia unobtainable	—	1
Instrumental delivery	28	2

THE Royal Northern Hospital, Holloway, has received £64 10*s.* 7*d.* from Mr. Peter Farquharson, total receipts of a concert given by the Highgate Village Orchestra, £25 from Mr. O. Braden, of Highgate, and £12, proceeds of concert arranged by the students of St. John's College, Highbury.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

A FEMORAL HERNIA OF UNUSUAL SIZE.

BY GEOFFREY KEYNES, F.R.C.S. ENG.,
ASSISTANT SURGEON, CITY OF LONDON TRUSS SOCIETY.

THE first of the accompanying figures illustrates in profile a femoral hernia which has attained a size seldom seen at the present time. The patient, a somewhat decrepit woman, aged 66, had never worn a truss, but had consistently neglected her rupture for more than 16 years. She recently presented herself for treatment at the City of London Truss Society, Finsbury-square, and it was then found that

the sac of a large left femoral hernia contained a great part of her intestines. Extensive adhesions had formed between the sac and its contents, and the hernia was irreducible. The patient's general decrepitude made an operation inadvisable. She was accordingly supplied with a truss as illustrated in the second figure. This was constructed much on the same principle as the "hollow-pad truss" used at this institution for many years past for treating small irreducible femoral herniæ when operation is refused. The size of the rim was greatly enlarged to fit the dimensions of the hernia, and the sac was supported by a closely-fitting moleskin bag. The steel spring of the truss then served to give the patient relief from the discomfort which she felt owing to the weight of the hernia.

A CASE OF ABDOMINAL PREGNANCY.

BY W. GIFFORD NASH, F.R.C.S. ENG.,
SURGEON TO THE BEDFORD COUNTY HOSPITAL.

THE following case is of sufficient interest to merit record.

Mrs. A., aged 42, wife of a soldier, married 14 years, had never had a full-time child, but had had four miscarriages, three between 1907 and 1909 and one in 1918.

History.—She thought she became pregnant between August 28th and Sept. 2nd, 1919, when her husband was home on leave. She missed her period in September. The

husband had five days' leave about Sept. 20th and again about Oct. 18th. On Oct. 28th she had severe abdominal pain lasting 12 hours. There was no bleeding. The abdomen was tender for 14 days. She remained fairly well until Dec. 20th when she had severe abdominal pain lasting all night and vomited once. On Jan. 7th, 1920, she again had pain and vomiting and fainted. After this she thought she felt movements. This was four and a half months after August 28th.

Examination.—She was first seen by Dr. G. T. Birks on March 18th for pains which had been going on for a few days. There was a slight show. On vaginal examination the cervix was soft and the lower uterine segment enlarged. A placental bruit was heard above the pubes; a hard projection resembling a fœtus was felt in the middle line of lower abdomen; there was milk in the breasts.

The pains continued until the middle of April. On May 10th she passed two big clots, which the midwife described as being like membrane. After this she felt no distinct movements. On the 23rd she had an attack of diarrhœa and vomiting. The abdominal swelling went on increasing until ten days before admission to hospital, when it began to decrease. Labour should have occurred about June 1st. As it did not come on she was admitted to the Bedford County Hospital on June 8th.

Condition on Admission.—She presented an abdominal swelling corresponding in size and appearance to that of a full-time pregnancy, but on palpation the swelling was firmer in consistence than that of a pregnant uterus. There were no movements, and no fœtal parts could be made out. On June 10th I examined her under chloroform. In part of the swelling above the pubes a small hard mass could be felt which in shape and position suggested a slightly enlarged uterus. On vaginal examination Douglas's pouch was filled up by a large soft boggy mass which displaced the cervix forwards and upwards. A sound passed 3 in. No fœtal heart sounds or uterine souffle could be heard.

Diagnosis.—A diagnosis of abdominal pregnancy with a dead fœtus was made.

Operation.—On June 17th a median incision was made from the umbilicus to the pubes. The peritoneum was very adherent to the wall of the sac. The sac was opened and a small amount of fluid escaped. The dead fœtus was extracted. The umbilical cord passed through a small opening about an inch in diameter at the bottom of the sac. This was dilated and the placenta, which lay in the pelvis behind the uterus, was removed. There was very little hæmorrhage. The uterus, which was about twice the normal size, lay in front of the sac. The sac extended upwards to the left above the umbilicus. As much as possible of the sac was cut away and two drainage-tubes were inserted, one into the bottom of the sac and the other upwards. The wound was stitched up except where the drainage-tubes emerged.

Result.—The discharge gradually diminished and the wound was completely healed except for a small sinus at the site of the lower drainage-tube, when the patient left the hospital on August 7th; this sinus closed about five weeks later. The patient has remained in good health.

CÆSAREAN SECTION IN THE FALKLAND ISLANDS.

BY F. G. W. DEANE, F.R.C.S. EDIN.,
COLONIAL SURGEON, FALKLAND ISLANDS.

I SHOULD like to record what I understand is the first case of Cæsarean section in this southernmost British colony. The mother, a primipara, aged 20, was admitted into the maternity ward at the King Edward VII. Memorial Hospital, Stanley, F.I., on August 12th, 1921. The bony pelvis was deformed and delivery in the usual manner was at once seen to be impossible; I therefore advised an operation to which the patient and relatives readily consented. Cæsarean section was performed by me in the usual manner and a fine boy weighing 7 lb. was extracted. Mother and child left the hospital on Oct. 12th, strong and healthy; the infant was christened Cæsar.

The climate here is most favourable to the successful issue of surgical operations, the usual aseptic precautions are taken, but virulent organisms so frequently met with elsewhere do not appear to exist here, or if they do, the climatic conditions do not allow them to flourish;

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF THERAPEUTICS AND PHARMACOLOGY.

A MEETING of this section of the Royal Society of Medicine was held on Feb. 14th, with Dr. LANGDON BROWN, the President, in the chair.

In the absence of Dr. H. H. Dale, Dr. J. H. BURN read a paper by Dr. DALE and Major C. F. WHITE on

Experimental and Clinical Comparison of Different Preparations of Neosalvarsan,

of which the substance was as follows:—

Attention was concentrated during the war on ensuring that the preparation of salvarsan and neosalvarsan supplied for use in this country were not unduly toxic. Salvarsan presented a relatively simple problem, but the true composition of neosalvarsan is a matter of some uncertainty, and the patent specifications do not give full working details of its preparation. The test imposed for toxicity being a fairly rigid one, the efforts of manufacturers were naturally directed to the discovery of minor modifications of process which would lower the toxicity of the product. As a result the toxicity of British neosalvarsans became much lower than that of the German preparation. Suspicion was later aroused as to their therapeutic efficacy. A test for therapeutic potency was worked out, using mice infected with *Trypanosoma equiperdum*. On this basis the British neosalvarsans were found defective, and the manufacturers were advised to alter their processes, with the result that they successfully produced preparations which were not more toxic than German neosalvarsan, and at least as potent in their curative action on the infected mice. Samples of deficient and of satisfactory efficacy were then selected, and clinical tests on these were made at Rochester Row Military Hospital by Major White and Mr. Mills. The criterion of activity was the rate of disappearance of spirochætes, from active syphilitic lesions, after a single dose of 0·45 g. The result was to place the preparations in the same order, as regards potency, as that deduced from the mouse test. This test is accordingly regarded as a satisfactory indication of efficacy, and its application is expected to result in the maintenance of British neosalvarsans at their present satisfactory level of efficacy.

Dr. R. L. MACKENZIE WALLIS read a paper on

Tests for Hepatic Insufficiency after Arsenobenzol Treatment.

He said he had been working for some time upon the tests of hepatic efficiency applied to the changes observed in eclampsia and the toxæmias of pregnancy, and had used the same tests for determining the effects of salvarsan compounds upon the liver. As the result of the trial of many tests he had adopted three as the most effective: (1) lævulose tolerance test; (2) blood lipase test (Whipple and others); (3) cholesterol content of blood (Myers and others).

1. *Lævulose Tolerance Test.*—The blood-sugar content having been ascertained, and the normal urinary sugar determined, 25 g. of lævulose were given to the patient. Fifteen minutes later the blood-sugar was again determined, and the process repeated at the half hour, hour, and hour and a half intervals. At the end of one and two hours the amount and nature of the urinary sugar was estimated. The results of the blood-sugar determinations were plotted in curves and compared with the normal controls.

2. *Blood Lipase Test.*—The lipolytic activity of blood serum was determined by estimating the amount of free acid produced by the saponification of ethyl butyrate by means of the lipase present in the serum. This test was valuable qualitatively rather than quantitatively, since when positive the lipolytic activity was ten times that regarded as normal.

3. *The Cholesterol Content.*—The cholesterol content of the blood was estimated colorimetrically.

Results Obtained.—The curves of blood lævulose content obtained from normal individuals after the lævulose meal was practically a straight line in every case, thus indicating that the liver possessed the power of storing lævulose in healthy individuals. When, however, cases with signs and symptoms of acute injury to the liver—e.g., eclampsia—were investigated by this test, there was a well-marked rise in the blood lævulose after the lævulose meal, and lævulosuria (which does not occur in normal individuals) appeared. When the test was applied to the immediate effects of salvarsan treatment on the liver, no definite alteration in hepatic function could be demonstrated in the majority of cases. In one case only was there an immediate effect (a rise) on the sugar curve produced, and in this case no ill-effect resulted from cautious continuation of the "914" or "606" treatment. When, however, the test was applied to patients six weeks to three months after the last of a series of "914" injections, the results were striking. Not only was a definite rise in the blood-sugar obtained, but lævulosuria was detected in several cases. The lævulose tolerance test therefore showed that the greatest damage to hepatic function occurred three months after the last treatment.

Post-mortem Appearances of Cases of "914" Poisoning.

Dr. T. H. G. SHORE made a communication on the Morbid Anatomy and Histology of 23 Fatal Cases of Poisoning by "914" which occurred at Etaples during the war. Eleven of these had shown signs of hepatic inefficiency (jaundice, &c.) before death, and the remainder died of hæmorrhage, encephalitis or dermatitis, or a combination of both. Of the cases that died while jaundiced, two-thirds exhibited atrophic livers, and the remaining third had livers which were much enlarged. Dr. Shore demonstrated stained sections of these livers, showing lobules of regenerating liver cells surrounded by fibrous tissue which represented the atrophied original liver tissue. The liver in all cases showed a striking diminution of fat. The kidney associated with these jaundiced cases resembled a "large white kidney" stained yellow. On section, many of them showed fat with somewhat unusual staining qualities; in some cases this fat was seen in the lumen of the convoluted tubules apparently in the process of excretion. The clinical history of these cases showed considerable variation, but in all cases the fatal illness lasted only about one week. In one case no "914" treatment had been given for 50 days before symptoms began. From these observations he concluded that the fat ordinarily present in the liver was removed as a result of the "914" poisoning, and was to be found in the kidney in the process of excretion in some way associated with the salvarsan bodies. In support of this theory another observer (A. T. Todd) had observed fatty casts in the urine after the administration of "914." Further, the fact that excretion was not complete at the end of 50 days seemed to him to constitute a grave argument against the weekly injections of "914" commonly practised.

Discussion.

The PRESIDENT inquired whether the lævulose tolerance tests gave similar results in catarrhal jaundice to those seen in liver derangements. If so, this would constitute evidence in favour of the theory that catarrhal jaundice was a true hepatitis.

Mr. J. E. R. MCDONAGH said that he had observed 67 cases of jaundice nearly all 12 weeks after the last injection of "914" or "606"; this was in most cases the last injection of a second course given some nine or twelve months after the first. As regards the therapeutic value of salvarsan, he considered it chiefly valuable in relieving symptoms; he did not consider its use in any way curative of syphilis. In support of this contention Mr. McDonagh stated his experience that early recurrences were much commoner since the introduction of "606"—such recurrences unfortunately reacted badly to any form of treatment.

Rear-Admiral Sir P. BASSETT-SMITH said that the number of trypanosomes in the blood of guinea-pigs used experimentally was subject to cyclical variations irrespective of treatment. If the same were true of mice, this fact might vitiate the results of Dr. Dale's work.

Dr. L. J. SPENCE considered that the liver efficiency tests described by Dr. Wallis would prove of great value in determining whether a second course of "914" might safely be given to a patient. As regards catarrhal jaundice, from his own work he concluded that the liver efficiency tests definitely showed that the condition was a hepatitis.

Dr. A. J. CLARK remarked on our ignorance of all the routes by which arsenic was excreted from the body. So far as he knew, nobody had examined the fæces to determine the proportion of arsenic excreted by the bowel.

Dr. A. POWELL said that after the administration of N.A.B. (914) one-third of the total arsenic given was excreted by the kidney within 24 hours. As regards the question raised by Dr. Clarke, there was no doubt that a great deal of the arsenic was excreted into the stomach and reabsorbed later from the bowel. Whilst in India, during the war, Dr. Powell had performed experiments on horses infected with *Trypanosoma evansi*. When given large doses of N.A.B. the parasites disappeared apparently for a time from the blood, but the animals were not completely cured, the symptoms reappearing later. Some of the animals were then given a lethal dose of N.A.B.; the post-mortem appearances observed corresponded closely to those of poisoning after the oral administration of arsenic. In India these post-mortem appearances were commonly seen, since the poisoning of an enemy's horse by arsenic was not infrequent. Dr. Powell thought that this fact might have an important medico-legal bearing in cases of suspected arsenic poisoning.

Prof. W. E. DIXON congratulated Dr. Dale on his choice of mice as experimental animals, since mice were the only animals in whom the number of trypanosomes were not subject to cyclic variations. He said that Dr. Mackenzie Wallis's test provided a convenient means of estimating excess of therapeutic action by many drugs—phosphorus and other elements would have similar effects which were due in the end to diminution of oxidising power of the body.

Dr. BURN said that there was a possible explanation of the recurrences of syphilis seen since 1914. Many of the "914" preparations made in this country during the war possessed little or no therapeutic value. Even now, in spite of standardised methods of preparation, a considerable variation in therapeutic value occasionally occurred. It was difficult to explain why the very high level of therapeutic value occasionally attained was not consistently kept up.

Dr. MACKENZIE WALLIS, in reply, said he agreed with Dr. Spence that the lævulose tolerance test showed most cases of catarrhal jaundice to be associated with a definite hepatitis.

SECTION OF ANÆSTHETICS.

AT a meeting of this Section of the Royal Society of Medicine held on Feb. 3rd, with Dr. H. J. SHIRLEY, President, in the chair, Dr. A. L. FLEMMING opened a discussion on

The Utility and Limitations of Nitrous Oxide Anæsthesia.

It would, he said, only court disaster to ignore the difficulties associated with the administration of gas or to minimise its possible dangers. In former years the choice of anæsthetic most often lay between chloroform and ether, now it was generally between ether and gas oxygen. Although experienced administrators could use gas oxygen for almost any type of patient or operation, yet, whereas ether could succeed alone, the gases required the aid of preliminary injections of local anæsthetics or of ether in

many instances. Certain physiological and pharmacological properties of nitrous oxide must be borne in mind. It has been shown that nitrous oxide exerts a specific effect upon the nervous tissues, that the motor areas remain more sensitive during the anæsthesia of gas than during that of ether, that gas somewhat abruptly interferes with oxidation of the tissues, that animals are killed by gas more quickly than by asphyxia, and that in animals the red blood corpuscles are diminished 25 per cent. after 30 minutes' anæsthesia with nitrous oxide. Nitrous oxide is a powerful drug but a poor relaxant. Consequently dosage is of importance, and to procure relaxation without cyanosis the addition of oxygen instead of air is necessary. In former days prolonged administrations of gas and air have been attended by dangerous respiratory depression and by outward displacement of the heart's apex. If enough ether is used with gas and air a very satisfactory result may be obtained. Nitrous oxide and oxygen alone may give rise to dangerous respiratory and circulatory embarrassment in the presence of abnormally high or low blood pressure. The anæsthesia may be followed by troublesome nausea. Nitrous oxide is most safe when used not as the main or sole relaxant but in conjunction with other agents. Dr. Flemming related cases illustrating difficulties that may be encountered during the use of nitrous oxide, oxygen, and ether, and discussed the efficacy of the two anæsthetics in combating or preventing shock.

Discussion.

Dr. G. A. H. BARTON protested against the loose use of the term gas and oxygen for a method which often involved the use of ether. If the anæsthetist confined himself to nitrous oxide and oxygen he met with many unsuccessful cases. If he first got the patient under with gas and ether and then continued with nitrous oxide and oxygen many good results were obtained. Often the best method was to give small amounts of ether throughout, along with the gas and oxygen. The method has advantages, if used intra-tracheally, in most operations about the head and neck and on the limbs. For throat operations he considered the anæsthesia insufficient, and the same was true of abdominal operations. The subjects of diabetes, albuminuria, and respiratory catarrh were especially well suited to gas and oxygen. For shock he could not agree with the value placed upon the method.

Mr. H. E. G. BOYLE remarked that the proper administration of nitrous oxide and oxygen and ether requires skill and constant practice. For the average man giving only occasional anæsthetics ether should remain the anæsthetic of choice. He believed in making induction of unconsciousness as quick as possible. He used ether or C E in conjunction with the gases as necessary, but it was remarkable how small an amount of these additions was needed even in long cases. Mr. Boyle believed that shock was less after the gases than after ether or chloroform. McKesson's secondary saturation certainly produced relaxation without any additional anæsthetic to nitrous oxide, but Mr. Boyle was not disposed to imitate the method.

Mr. J. H. CHALDECOTT said that the only method of using gas and oxygen which produced ideal results in abdominal and other serious operations was that of combining it with local anæsthesia. Satisfactory relaxation during operation and a minimum of discomfort afterwards could be obtained in this way only. The nerve-blocking provided the relaxation and the freedom from shock. The nitrous oxide was responsible mainly for unconsciousness. He deprecated the use of nitrous oxide and oxygen alone for these cases, but for other operations it was a good plan to induce anæsthesia with gas and ether and continue with gas and oxygen. For desperate cases he would not employ gas and oxygen except with nerve-blocking. If the latter were not employed he would prefer ether.

Mr. H. M. PAGE said that after much experience he would be very sorry to abandon water-feed apparatus for gas and oxygen. Several years ago he had advocated the induction of anæsthesia by gas and ether and its continuance with gas and oxygen. When difficulties occurred they should be met by recourse to additional ether, not by pushing the nitrous oxide, yet every saving of ether vapour that could be effected by the use of gas improved the after-state of the patient.

Dr. F. E. SHIPWAY regretted the absence of a physiologist who could explain to them the causation of alarming symptoms that arose under gas and oxygen. Some cases of sudden and unexpected fatality during the inhalation were explained by the writings of Haldane, who had shown that acute or long-continued anoxæmia more quickly and certainly paralysed the respiratory centre than it did the heart. Slight changes of colour were difficult to detect, and clinically some oxygen deprivation might be produced unawares. In handling difficult subjects Dr. Shipway recommended increasing the oxygen-supply and addition of ether rather than reliance on nitrous oxide. The latter is contra-indicated particularly in persons of high blood pressure or with arterio-sclerosis. Nor is gas and oxygen suited to active or recently healed tuberculous lungs. The rapid or deep breathing which may be set up is prone to cause spread of the disease or fresh breaking down. Gas and oxygen was the best anæsthetic in the treatment or prevention of shock, and H. H. Dale's work on histamine was most suggestive in this connexion.

SECTION OF OTOLOGY.

EXHIBITION OF CASES AND SPECIMENS.

A MEETING of this section of the Royal Society of Medicine was held on Feb. 17th, Dr. ALBERT A. GRAY presiding.

Otitic Meningitis.

Mr. G. J. JENKINS demonstrated a series of patients who had had infection of the meninges via the labyrinth successfully treated by translabyrinthine drainage. One of the patients showed the importance of early diagnosis, and indicated that the surgeon should operate and drain the meninges in early cases in which he found lymphocytes present in the cerebro-spinal fluid before there were any polymorphs at all, if the case were one of infection through the labyrinth. In one case the labyrinth was destroyed by a tract which went to the semicircular canal on the left side; and Mr. Jenkins subsequently had to do an operation on the other side, when he found a similar tract going to the superior semicircular canal on the right side. One man had labyrinthitis first in the right ear, and, a few months later, in the left, followed by meningitis. In both the operative treatment was successful. He believed symmetry of pathological processes was found more commonly in labyrinthine than in any other form of ear disease; and fistulæ of the ampulla of the superior semicircular canal were perhaps more commonly bilateral than any other pathological process. A man who had lost both labyrinths could do things which the ordinary man could do and some things which the normal person could not do. He could be rotated at any speed, and could get straight up and walk away as if he had not been rotated at all. With this exception he behaved like a person who had had equal stimuli applied to both labyrinths simultaneously. This case also demonstrated that the ataxia arising from incoördination of the cerebellum was different from the stumbling due to obstruction of the labyrinth. The labyrinth must be looked upon simply as the tract or means by which the cerebellum obtained certain information which was of value in incoördination.

The PRESIDENT emphasised the importance of these cases because of the lessons they conveyed as to the increased recoverability of meningitis. Not very long ago the occurrence of meningitis was regarded as of fatal import, but many recoveries from that condition were now on record. He asked whether the patient who had had both labyrinths removed had since been

to sea, and if so, whether he had seasickness, in view of the question whether it was a disturbance of the vestibule or of the canals which brought on seasickness.—Mr. HERBERT TILLEY asked whether, in cases of meningitis of otogenic origin which did not show organisms in the cerebro-spinal fluid, Mr. Jenkins advocated operating through the labyrinth, as opposed to mere lumbar puncture.—Mr. J. F. O'MALLEY asked whether, assuming that purulent meningitis could be diagnosed by examining the cerebro-spinal fluid, and that he could not state that the infection had gone through the labyrinth, Mr. Jenkins considered that the ideal treatment would be the one he had carried out in these cases.—Mr. W. STUART-LOW drew attention to the value of suction applied to the inner wall of the middle ear in this type of case.—Mr. JENKINS replied that his work had been based upon that of Mr. C. E. West and Mr. Sydney Scott. If a patient had meningitis tracking through the labyrinth—i.e., labyrinthitis followed by meningitis—the internal auditory meatus must be opened, whatever else might be done, because in the meatus was a small pocket, which was often a septic focus, and that must be cleaned out. If in any case organisms had not yet got into the meninges—i.e., if the meningitis was merely irritative—lumbar puncture might cure it; but he knew of no means of being sure whether organisms had got into the meninges. If a patient had meningitis which was translabyrinthine in nature, one should in all cases operate through the labyrinth; lumbar puncture in such could only be regarded as helpful, not as a curative measure. He detailed his operative technique.

Mr. W. H. OGILVIE showed the case of a girl of 12 who had recovered from localised suppurative meningitis.

Second Removal of Exostosis from an Ear.

Mr. RICHARD LAKE and Mr. A. J. WRIGHT showed an exostosis which had been removed from the posterior wall of a healthy man, being the second which had been taken from that meatus in nine years. After the first operation an anterior perforation was seen in the membrane. The growth had been removed through a post-auricular incision. Three years after the first operation the anterior meatal wall was swollen, and in October, 1920, an aural discharge developed. The meatus subsequently became dry and the patient showed marked mental depression. The following month a second bony growth was removed through the meatus; it was attached by a broad base to the anterior meatal wall, but its main attachment proved to be to the floor of the meatus. The recovery was straightforward. Another similar case accompanied by mental depression was referred to.—In the discussion the question of the advisability of operation in these cases with the electric drill was raised, but owing to the possibility of the formation of granulations, pain, and re-closing of the meatus the post-aural operation was deemed preferable.

Otosclerosis.

Mr. LAKE showed a series of cases of otosclerosis to illustrate points in the incidence of the disease and the effect upon it of the removal of septic foci. In these cases great improvement followed treatment by (1) removal of tonsils, in three cases; (2) exploration and drainage of diseased antrum; and (3) removal of septic teeth and carious portion of jaw.—The PRESIDENT thought the removal of all discovered septic foci was all that could be done for cases of otosclerosis, and he commented on the fact that often the hearing of an otosclerotic patient was much better while he was suffering from a common cold.

A Pontimeter.

Mr. T. B. JOBSON demonstrated an instrument he had devised for measuring the bridge in mastoid operations. He claimed that it enabled the operator to ascertain the depth of bone to be cut away before the complete removal of the bridge.

MEDICAL SOCIETY OF LONDON.

THE TREATMENT OF TUBERCULOUS GLANDS.

A MEETING of this Society was held on Feb. 27th, with Mr. JAMES BERRY, the President, in the chair, when Mr. G. GREY TURNER read a paper with this title, illustrated by a number of lantern-slides of patients taken before and after operation. He referred first to changes of fashion in surgical treatment. Twenty-five years ago extensive operations were brilliantly executed, often with disappointing results. Then followed an interval when surgical attack was "niggling," and other methods of treatment—such as X rays, vaccines, and radium—were frequently applied. None of these changes in fashion were based on due appreciation of the pathology of the condition, and the more modern methods of treatment were often followed by results as disappointing as those of the earlier era.

Pathology.—There were two main routes of infection: (1) through the naso-pharynx, (2) through the mesenteric and mediastinal glands.

(1) The naso-pharyngeal route of infection was now well recognised, and abundant evidence of the coincident presence of tubercle bacilli in tonsils and adenoids and in the enlarged cervical glands had been given, although the proportion of tonsils in which tubercle bacilli were found varied according to different observers. This might be due to the different stages of the disease at which the tonsils were examined. The work of Mr. W. G. Howarth and Dr. S. R. Gloyne, for instance, was upon older children apparently the subjects of a chronic adenitis. Mr. Grey Turner thought that the tubercle bacillus was probably a rapid passenger through the tonsil during the first two years of life and could not be found there later, although it had gained a firm footing in the tonsillar glands. More statistical work on this subject was still required.

(2) The mesenteric route of infection, though recognised by many physicians, was not sufficiently recognised by surgeons. Infection took place through the gut from cow's milk, again usually during the first two years of life. The infection was often latent in the mesenteric glands for a long period, but when the patient's resistance was lowered outcrops of tuberculous glands appeared in the neck or axilla or groin. When this route of infection was responsible for the disease the glands first to be affected were those at the base of the neck. There was evidence of this from operation, where glands at the base of the neck were often found to contain pigment, and from the finding of chains of glands passing through the thorax from the abdomen at post-mortem examinations.

Text-books attributed tuberculous glands in the groin and axilla to infection from primary tuberculous bone or other disease in their catchment areas, but in Mr. Turner's experience it was very uncommon to see such primary foci. Other very rare sources of infection were the cornea, skin, and teeth. The two types of glandular injections presented different clinical histories and required different treatment. The first or naso-pharyngeal type appeared sometimes in early infancy, but more commonly between the ages of 6 and 12 as recurring painful glandular swellings in the upper part of the neck. Abscesses were apt to form rapidly in this type, and the mere opening of these was in no way curative, since the infected glands lay beneath the deep fascia and remained unaffected by a superficial opening. The glandular enlargement was commonly bilateral but not symmetrical. The mesenteric type of glands rarely appeared in the neck before 8 to 9 years of age, was common about puberty and adolescence, and occurred less frequently up to even old age. The subjects of this type of glandular tuberculosis were often anæmic and in poor health, sometimes with a mild degree of pyrexia. Periadenitis and softening were less usual in this type of case, wherein ill-considered and wrongly-timed operations were often followed by bad results. The patient not infrequently died within five or six years

from tuberculous disease elsewhere—either phthisis, tuberculous peritonitis, meningitis, or generalised tuberculosis. It was the first or naso-pharyngeal form which reacted best to surgical treatment. Here was an opportunity such as seldom presented itself to the surgeon to eradicate the primary focus and determine the extent of the disease. He advocated the removal of the tonsils and adenoids, and the excision of the affected glands later. For the second type the indication was to use every possible means to raise the patient's general powers of resistance. When the patient's condition was improved the excision of local masses of enlarged glands in the neck, axilla, or groin might be justifiable for the relief of recurring attacks of periadenitis or occasionally for deformity, but operation during the acute stage was often attended with disaster, since the glandular mass visible in the neck or elsewhere was but a branch of a tree whose roots lay in the abdomen and whose trunk was in the mediastinum.

Operative Treatment.—The time for operation in the naso-pharyngeal cases was often dictated by the onset of softening, after which operation should not be delayed; otherwise a week or two of constitutional treatment was advisable. Incisions should lie in the natural folds of the neck, and if necessary should be prolonged backwards into the hair-line. Excision of tuberculous glands should be thorough, and the whole operation conducted under the guidance of the eye. Hæmostasis was most important. He often excised the tonsillar group in three portions, so as to be able better to see and avoid the spinal accessory nerve. The platysma must not be dissected away from the skin on account of the danger of wounding the infra-mandibular branch of the facial nerve. He always drained through a separate small incision behind the sterno-mastoid. For abscesses he employed a similar but smaller incision, removed all tuberculous granulation tissue and débris, and packed the wound for 48 hours with sterile gauze, or, if a secondarily infected sinus had existed before, with gauze impregnated with pure carbolic acid. When the gauze was removed he often found it possible to perform secondary suture successfully. Mr. Grey Turner showed comparative tables of results in the two types of glandular tuberculosis described, demonstrating how much greater was the proportion of successes in the naso-pharyngeal type.

Discussion.

Sir LENTHAL CHEATLE said he could not accept Mr. Grey Turner's statement that when tuberculous glands appeared at the base of the neck they were infected from the mesentery. Some time ago he experimented upon animals with injections of cultures of staphylococci into the subcutaneous tissues. If the animals were allowed to live the only effect was a local abscess, but if the animals were killed within ten minutes of the injection, staphylococci could be found in the heart, lungs, and other organs, showing that the infection for a time was a septicæmia. Sir Lenthal Cheatle thought it possible that a similar septicæmia might occur in the case of the tubercle bacillus, so that it was hardly possible to state definitely what was the source of infection in any case. Even the condition of the tonsils—i.e., whether or not they contained tubercle bacilli—could not be considered valuable evidence.

Sir Lenthal Cheatle said that his treatment of tuberculous glands varied, according to the stage of the disease. He recognised three stages, as follows:—

1. *Deposition of Tubercle Bacilli in Glands.*—In this stage the disease was localised to the swollen and confluent glands. Fresh air, rest, and general hygienic treatment were of great importance. The removal of any enlarged tonsils and adenoids, together with a supply of pure milk, and better conditions of health for the children was one of the most effective measures for preventing this disease. Tuberculous glands were not so frequently seen now as 10 years ago. In his opinion the use of vaccines, X rays, and radium had not hitherto been successful. The free removal of all affected glands was the best line of treatment. This was especially indicated when tuberculous glands occurred in the neck, axilla, and groin. Sir Lenthal Cheatle preferred not deliberately to open the abdomen for the removal of tuberculous mesenteric glands, since patients did well with rest in a good environment.

2. *Ulcerative Process from the Glands to Outside Structures.*—This stage would include general tuberculosis, and treatment of the localised affection was comparatively unimportant. The abscess formed was attached to the skin, or was just underneath. His practice was to open it by a small incision, which he did not sew up. He did not scrape the abscess wall. The patient was then kept at rest in the fresh air until the swelling had subsided, and then the glands, sinus, and possibly the affected part of the sterno-mastoid muscles were excised. After this operation, as well as after the removal of glands in stage 1, he washed out the wound with 1 in 500 perchloride of mercury; he thought this precaution was invaluable. A deposit of albuminate of mercury was left in the tissues, and it was hoped that any stray tubercle bacilli would be destroyed by this agency. A drainage-tube should not be inserted into these wounds. The operation was difficult and should not be lightly undertaken.

3. *Post-tuberculous Deformity and Scarring.*—Sir Lenthal Cheatle said that the ugly, sometimes pigmented, and deeply retracted scars which result from the bursting of tuberculous glands in the neck could be excised and replaced by linear cicatrices which tend to become invisible. He had removed a retracted scar from the neck of a patient nearly five years after the tuberculous glands had burst. At the apex of the scar there were some cheesy remains of one of these glands. When this substance was injected under the skin of a guinea-pig, the animal died of generalised tuberculosis. This proved that the tubercle bacilli in the patient's gland were alive and active after five years' quiescence.

Mouth Infections as a Factor.

Mr. W. CLAYTON GREENE commented on the rarity of tuberculous cervical adenitis compared with its incidence 20 years ago. This he attributed to the attention now devoted to the teeth of school children, and to the much more frequent removal of enlarged tonsils and adenoids. It was his practice always, when treating a case of cervical adenitis, to look for a focus of infection in the mouth, and not to operate until that focus had been adequately treated. He was once consulted by a patient who had four "stopped" teeth, and he was doubtful whether these teeth could not still be regarded as the infecting focus. As regards treatment of breaking down glands he incised, curetted away all tuberculous material, and injected a bismuth iodoform emulsion. For persistent sinuses, X rays were most beneficial. He personally had no faith in tuberculin for these cases. As regards mesenteric tuberculous glands, a point in the diagnosis was the repeated attacks of colic from which these patients suffered. The chief and almost only danger of the condition was intestinal obstruction. Intestinal obstruction occurring in a patient under 16 years was almost invariably due to the cicatrisation of an old mesenteric tuberculous focus. When, therefore, he discovered tuberculous mesenteric glands during any abdominal operation, he made a practice of removing them unless such removal involved danger to the blood-supply of the bowel. As a general rule he believed that nature's power of healing tuberculous disease was so great that it was only rarely necessary for the surgeon to interfere in tuberculous adenitis.

The Point of View of the Dental Surgeon.

Mr. WARWICK JAMES dealt with the treatment of tuberculous glands from the point of view of the dental surgeon. As a prophylactic measure the treatment of the teeth was of the greatest importance. Mouth infection induced changes in the glands, rendering them more liable to tuberculous infection. It had also been claimed that tubercle bacilli might enter directly from the mouth. It was remarkable

that a primary tuberculous lesion was very uncommon in the mouth. He thought it improbable that the tubercle bacillus ever gained access directly to the glands from the mouth. The period when prophylactic treatment of the mouth was most important in connexion with tuberculous glands was the period of infancy. This was also the tonsil and adenoid period, and it was now recognised as important to extract all infected temporary teeth prior to the tonsil and adenoid operation. For a period of nearly ten years, while dental surgeon at Great Ormond-street, he had made special observations of the condition of the glands in the neck in children. The majority of enlarged glands diminished rapidly in size, to a small contracted nodule, after the extraction of septic teeth and operation for tonsils and adenoids. He concluded that numerous operations for tuberculous glands in the neck had been performed upon glands that were not truly tuberculous. A large number of patients with glandular enlargement were mouth-breathers, as was clearly shown by some of Mr. Grey Turner's illustrative cases, and unless this condition were corrected mouth infection was certain to recur; moreover, a constant source of glandular infection was present in mouth-breathers. It might be justly claimed that the dental surgeon and laryngologists jointly had helped to reduce the incidence of tuberculous glandular infection in children.

Conservative Treatment.

Sir HENRY GAUVAIN congratulated Mr. Grey Turner on his results, which were very much more satisfactory than many he had seen. Scrofuloderma was, unfortunately, in his experience a not uncommon sequel to extensive surgical measures for tuberculous adenitis. He therefore preferred conservative methods and was well pleased with the results he had obtained from them. For children under 5 years country air was better than that of the seaside; the latter, however, was preferable for older children. When glands broke down he considered aspiration to be the best form of treatment. When this alone was not curative he employed a seton for about three weeks. This was almost always curative and left no more disfiguring scars than those described by Mr. Grey Turner. Where massive periadenitis existed the X rays rapidly caused this to disappear, leaving only small glandular swellings. The sinuses often seen after a tuberculous abscess had burst or been opened were frequently due to the irritation of a small mass of caseous matter at the bottom of the sinus acting like a sequestrum. If this caseous mass were removed the sinus would generally heal.

Non-tuberculous Adenitis.

Mr. W. G. HOWARTH considered that the tonsil was the path of infection in the majority of cases of cervical tuberculous adenitis. If surgeons were content to wait for some time after tonsillectomy had been performed, they would find that the enlarged glands would disappear in the vast majority of cases, but he impressed upon them the necessity for waiting for a considerable period. One speaker had mentioned the persistence of enlarged glands 14 months after the removal of tonsils. He thought that an even longer interval should be allowed. After tonsillectomy in acute cervical adenitis the glands occasionally broke down. Aspiration of the pus was usually sufficient for these cases, and when, as occasionally happened, a sinus formed, it would readily heal under the influence of X rays. Finally, he said that many cases diagnosed as tuberculous adenitis were in reality chronic infective lesions.

Mr. D. C. L. FITZWILLIAMS said that he had recently come back from a tuberculosis congress, as a result of which his views had been altered. It would appear to be fairly generally accepted that everybody was infected with the tubercle bacillus, and that the manifestations of tuberculosis depended merely upon the local and general resistance of the individual. In early life the lymphatic glands were the most vulnerable, and consequently the most frequent seat of tuberculosis. In adolescence the bones and joints were more readily affected, and in adult life the lungs. There could be no question that operation for tuberculous glands was less frequently performed now than formerly. The attention now directed to the teeth and tonsils undoubtedly was responsible for this improvement. It was his belief that the tubercle bacillus got a strong hold only on glands that were already enlarged from "chronic infection." He was accustomed to divide cases into two classes. In the first class rapid spread occurred, and abscess formation was common; the second class comprised a very slowly progressive type accompanied by considerable periadenitis. When this latter type of gland broke down the discharge of tuberculous pus and caseous matter usually occurred from multiple points. This type might be latent for years, and yet recur actively in old age. As regards the treatment of abscesses, Mr. Fitzwilliams thought that the fact that the glands themselves, the source of the pus, lay beneath the deep fascia was sufficient to condemn aspiration as routine treatment. In his experience aspiration was only successful in a very small proportion of cases, perhaps one-fifth. He concluded by referring to the excellent results which could be obtained by the excision of the unsightly scars left after tuberculous abscesses. If the platysma were dissected out and resutured as a separate layer before closing the skin wound scars could be obtained as satisfactory as those which Mr Grey Turner's lantern-slides had shown.

Dr. A. LAPTHORN SMITH described a case on which he had operated for a large abdominal tumour which was discovered to be a mass of tuberculous glands. Attempted removal of this mass resulted in severe hæmorrhage, and the abdomen was therefore closed without further interference. The patient was moved to the sunniest part of the ward, and with no other treatment beyond the administration of syrup of the iodide of iron, made an uninterrupted recovery. The tumour disappeared almost completely within a few weeks. In his experience tuberculous glands of the neck never called for severe surgical measures. Curetting was sometimes necessary, but sunshine, fresh air, and iodine were more potent remedies than surgery.

In reply Mr. GREY TURNER said that he did not think Sir Lenthal Cheatle's inferences from his experimental work upon animals could be applied to the tubercle bacillus, which differed in many ways from the staphylococcus. In reply to Mr. Clayton-Greene, he wished to make it clear that all his statements and the figures he quoted applied to cases definitely proved to be tuberculous, either microscopically or bacteriologically or both. He would ask those who advocated other forms of treatment to bear in mind that relapse frequently occurred after apparent cure. Again, while Nature might achieve as much as the surgeon or even more, Nature's cure of tubercle was a very slow process. In the naso-pharyngeal type of tuberculous cervical adenitis good results should be obtained from surgery; unsatisfactory results only followed bad surgery. When operation was undertaken it must be thorough and painstakingly carried out.

DEVON AND EXETER MEDICO-CHIRURGICAL SOCIETY.

A MEETING of this Society was held at the Royal Devon and Exeter Hospital on Feb. 23rd, Dr. J. SHIRLEY STEELE-PERKINS, the President, being in the chair.

Dr. G. L. THORNTON read a paper on

Nephritis in Relation to the Late War.

He divided his subject into two parts, of which one consisted chiefly of personal observations made on cases which had occurred amongst divisional troops, and the second comprised a study of 100 unselected cases of ex-soldiers who had suffered from nephritis during the war, and who had been examined at periods varying from 2–7 years after the onset of the disease.

The PRESIDENT, speaking from his experience at Netley Hospital, where a large number of men were admitted suffering from trench fever and albuminuria, and from his later observations on a large number of ex-service men, commented upon the comparative rarity of cases now encountered with gross signs of renal disease.

Sir HENRY DAVY alluded to the researches of Dr. Mahomed on acute scarlatinal nephritis some 50 years ago. He considered that the primary type of war nephritis was a glomerular nephritis pathologically identical with the scarlet fever form of the disease. War nephritis was, however, often a mixed affection, and many men enlisted with kidneys previously damaged, thus producing a more severe and complex type of case. In his opinion the true acute nephritis resembling that met with in scarlet fever progressed as favourably as it did in scarlet fever. Sir Henry Davy considered that various toxins might have been at work—that of trench fever amongst them. He had seen many cases of combined trench fever and nephritis, and had observed that the nephritis cleared up as soon as, if not more rapidly than, the trench fever. In several post-mortems he had observed morbid processes in the glomeruli and in the fine capillaries of the lungs.

Dr. F. A. ROPER considered that war nephritis was a distinct disease, while admitting that cold and wet provided a factor in civil cases. He had seen an interesting curve which demonstrated that nephritis attacked troops during the first six months of their service overseas, and that if they remained immune during that period they subsequently escaped the disease. From his own experiences in a C.C.S., Dr. Roper considered that breathlessness, pulmonary symptoms, and œdema were the earliest manifestations, and he had invariably found the bases of the lungs affected when men were admitted complaining of breathlessness. Dr. Roper had noted a very sharp rise in blood pressure as a precursor of impending uræmia. Very few deaths had occurred in his cases, and he had relied largely on venesection and morphia in the treatment of uræmic symptoms. Saline infusion had not given promising results. Rapid fluctuation had been noted in the volume of urine passed—10–30 oz. per diem often increasing to an output of 90 oz. in 24 hours. He considered that abnormally high blood pressures were pathognomonic of an acute grafted upon an old infection.

Dr. R. V. SOLLY did not consider that there was anything new in war nephritis. He spoke of recent experiments where injections of a specially prepared toxin produced acute nephritis in rabbits. Dr. Solly commented upon the various renal efficiency tests devised by H. Maclean, and asked if the normal diastatic index as given by Dr. Thornton was not somewhat high. He considered that these tests should prove of great value in determining the fitness of a patient before he was submitted to severe surgical procedures.

Dr. W. GORDON said that there were certain important points for elucidation: Are we in war nephritis contemplating nephritis in general or some special disease? There should be some certainty. If treatment was to be successful this point must be cleared up. Will the handicap on the renal function become a permanency? From his own observations he had come to the conclusion that war nephritis was not identical with the acute nephritis of civil life. He had found the kidneys tender to palpation and he had noted a peculiarity in the hæmaturia—the urine being rusty-coloured and viscid in character.

Dr. A. E. CARVER said that when attached to a Serbian hospital of 2000 beds he only remembered one admission for nephritis, and he concluded that in spite of exposure the Serbians had shown a great resistance to this affection. He had observed that persistent recurring hæmaturia was a common feature amongst cases under his care in a hospital at home.

Dr. THORNTON briefly replied.

Reviews and Notices of Books.

PSYCHO-ANALYSIS.

Morbid Fears and Compulsions. By H. W. FRINK, M.D., Professor of Neurology in Cornell University Medical College. London: Kegan Paul. 1921. Pp. 344. 21*s*.

IN an American edition this book has already become a standard work on the clinical application of psycho-analysis. It is superficially less attractive than some of the popular expositions that have lately appeared, and will appeal only to those who are making a serious study of the subject; in short, it is a text-book of this particular branch of medicine. An introduction by the late Dr. J. J. Putnam is mildly polemical and questions the rigid determinism of Freud, as well as his view that the function of the analyst towards the patient is not that of a mentor.

Dr. Frink avoids both controversy and that enthusiasm which sometimes mars a would-be scientific presentation of psycho-analysis; he draws freely upon the writings of Freud, but shows evidence of abundant first-hand knowledge and shrewd observation. The three phases of development of sexuality—the infantile, the latent phase of childhood, and the final phase of object-love—together with the formation of infantile sex theories, soon to become repressed, are described along familiar lines. The use of the name "unconscious" is defended upon pragmatic grounds. Dr. Frink holds the view, to which the theory of Jung offers an alternative which is less terrifying, that the content of the unconscious is primitive and savage and that unconscious processes are uninfluenced by reality and not orientated according to time; "the unconscious can only wish." The function of the foreconscious, and the conception of a two-fold censor—between the unconscious and the preconscious and between the latter and the consciousness—are made as clear as is possible, though even then the beginner will not find an easy path. The processes concerned in psychopathological manifestations are freely illustrated by examples from the author's own case-books and, like most practical psycho-analysts, he does not hesitate to draw upon personal experiences to illustrate a point. Having laid down this groundwork he takes a survey of the neuroses as a whole. His classification is naturally a Freudian one; he recognises conversion hysteria (the ordinary hysteria of the text-books, which is not so common or so important as is usually thought), anxiety hysteria and anxiety neuroses (which always occur in combination), and the obsessional neurosis. A case of the last, with an analysis, is reported at length and forms the most valuable part of the volume. In the final chapter is an excellent example of the method of using a negative transference in analysis. The whole subject is treated from the standpoint of clinical usefulness. The chapters on theory look formidable, but the reader who wishes to obtain a grasp of clinical psychology from the psycho-analytical point of view will find that the study of the book is full of interest, that there is very little redundancy, and that any difficulties he meets are inherent to the subject and inevitable in any thorough presentation thereof.

The Psycho-analytic Study of the Family. By J. C. FLÜGEL, B.A., Senior Lecturer in the Department of Philosophy and Psychology, University College, London. London: The International Psycho-analytical Press and George Allen and Unwin. 1921. Pp. 259. 10*s*. 6*d*.

Mr. Flügel believes that the psycho-analytical study of the primitive aspects of the mind will contribute to the solution of many of the moral and social problems which face mankind. The growth of human institutions has been so much the product of unconscious forces, as the writer himself shows, that it seems over-sanguine to hope to bring it under conscious control; this book, however, is an important contribution to individual and social psychology, and there

are many possible applications of the writer's views in the discussion of current problems. Family influence he shows to be the most potent of the forces controlling mental development, the love for parents being the first altruistic sentiment—the germ from which all other affections spring. The identification of this love with the later loves of adolescent and adult life, and its supposed influence in the neuroses, has aroused repugnance and incredulity towards the work of Freud, increased by his demonstration that family relationship calls forth hostile emotions almost as much as love. These, with the quasi-sexual forms of love between members of the same family, become subject to repression and are then not incompatible with genuine affection at the conscious level.

Mr. Flügel makes clear the difference between Freud and Jung, the latter being described as "post-psychoanalytic"; he admits that behind the sexual meaning of the Œdipus myth may lie a symbolisation of the tendency to repress the unpleasant rather than face the truth at the risk of painful discoveries. He admits, too, that birth phantasies bear the symbolism not only of a return to the state of repose of intra-uterine life, but also of a re-birth or moral regeneration. It is at this point that his tentative inquiry as to the possibility of actual memory being concerned in the birth-phantasy will perhaps arouse amused incredulity; upon firmer ground stands the relation of the phantasy to the curiosity of the child, always manifested and nearly always met by the prohibitions of the taboo, and then directed to the building-up of more or less conscious theories which are repressed later.

Family fixations and their influence upon the love-choice and successful and happy married life are of importance in these days of divorce discussion. Submission to parental authority is the foundation of social order, but circumstances may call up the emotion attached to the father-hatred complex, which then becomes a factor in producing revolt. As an example of filio-parental emotions transferred to the state the author notes the different significance of the English "Motherland" and the German "Fatherland." The undue strength of the infantile attitude to the family hinders successful biological adjustment. Hence the main lesson taught by Mr. Flügel is the need for a timely loosening of the family bonds. The child needs love so that its own love impulses may properly develop, but parental love must not keep the individual in a state of dependence. Just as economic independence is one goal of parental care, so psychological independence needs the weaning process; the practical application of these principles is not neglected by the author.

Mr. Flügel is a psychologist, not a medical man; occasional reference is made to Freud's theory of the neuroses, but the aim of the book is to apply the findings of psycho-analysis to social psychology, and the purely medical interest is slight. It is a consistently developed thesis, smoothly written, assumes no previous acquaintance with the subject on the part of the reader, but takes for granted that he is willing to accept psycho-analytical principles. It should be read by whoever is interested in broad views of human affairs.

Leonardo Da Vinci. A study by SIGMUND FREUD, M.D., LL.D. London: Kegan Paul, Trench, Trübner and Co., Ltd. 1922. Pp. 130. 12*s.* 6*d.*

THIS is a translation of Freud's well-known psycho-sexual study of the great artist, made some time ago by Dr. A. A. Brill, lecturer in psycho-analysis and abnormal psychology in New York University. The English version is a reprint of the American edition, and is prefaced by Dr. Ernest Jones, President of the International Psycho-Analytical Association, with whom we agree when he says that a work so well known needs little by way of introduction. Freud's study is based on an infantile reminiscence of Leonardo, which is explained on psycho-analytical principles in order to throw light on Leonardo's character. There seems to be a great amount of speculation mixed with the deductions to be drawn from one puzzling episode.

Psycho-Analysis in the Service of Education. By Dr. OSKAR PFISTER, Pastor and Seminary Teacher at Zurich. London: H. Kimpton. 1922. Pp. 176. 6*s.*

THIS is a series of lectures by a Protestant clergyman whose larger work on "The Psycho-analytic Method" is fairly well known; they are enthusiastic and rather discursive, but contain plenty of good matter, practical and theoretical, and show the author to be guided by the desire to remove neurotic inhibitions and relieve suffering. He claims that many difficulties of childhood and adolescence are suitable for treatment by the psycho-analytical pedagogue and produces sufficient material to make out a good case for the claim. But he goes further and complains (p. 30) that "most physicians, on account of their one-sided physiological and materialistic training and orientation, on account of their total ignorance of mental processes, are usually highly unsuited for the treatment of the so-called psycho-neuroses—i.e., maladies dependent on mental factors." It is well, perhaps, to consider this complaint, though it has not a fraction of the justification it might have had ten years ago. If psycho-analysis is an efficient therapeutic measure we must sooner or later face the question whether it is to become a part of regular medicine or whether it is to be handed over to practitioners who are technically irregular, even if they are as competent as Dr. Pfister appears to be. What is this standard of safety to be?

HYPERPIESIA AND HYPERPIESIS.

By H. BATTY SHAW, M.D., F.R.C.P., Physician to University College Hospital. Oxford Medical Publications. London: Henry Frowde and Hodder and Stoughton. 1922. Pp. 191. 21*s.*

Dr. Batty Shaw's monograph is based on the study of 47 cases in their clinical course and post-mortem findings. The book is dedicated to Sir Clifford Allbutt, and it is of interest to remember that in his work on Diseases of the Arteries Sir Clifford Allbutt regretted that few post-mortem examinations on cases of hyperpiesia were available; Dr. Batty Shaw's records make good this deficiency. The work is essentially the record of one man's experiences, and his singleness of vision is not complicated by the numerous and conflicting observations and opinions of other workers in this field of medicine.

The first half of the book is given up to the clinical description of the 47 cases, a record which is greatly enhanced by the description of the post-mortem appearances and careful account of the histology of the kidneys contributed by Dr. T. W. P. Lawrence. The second half is concerned with a critical discussion of the data with a final chapter on treatment. Hyperpiesis, and the criteria of its presence, is exactly described, the word being used in the sense of hypertension of four days' duration. It is recognised by a systolic blood pressure of 150 mm. Hg or over and by an accentuated second sound at the aortic base, while cardiac hypertrophy is the hall-mark of this clinical sign. Hyperpiesia, the clinical state, does not lend itself to so concise a definition. Dr. Batty Shaw extends its scope to include cases of kidney disease with hypertension. In spite of this extension of definition from that originally offered by Sir Clifford Allbutt and the variety of the clinical aspect of patients with hypertension, the condition of hyperpiesia has taken so definite a form in the author's mind that it is recognised in a clinical picture that is confused by the presence of hydronephrosis, empyema, and granular kidney (Case 9).

The author's view of hyperpiesia is best understood by the study of Cases 45 and 46. The first sign of its development is hypertension; it is established by cardiac hypertrophy; cardiac hypertrophy and vascular change are phenomena which develop later than hyperpiesis, but still may be looked upon as early manifestations of the disease. The latent, symptomless course of hyperpiesia in many patients is emphasised by Dr. Batty Shaw; it may declare itself only in a terminal state the clinical picture of

which is heart failure, pulmonary œdema, or coma and convulsions, while other modes of death are described as resulting from uræmia, terminal infection, carcinoma, and apoplexy. Considerable interest attaches to the author's observations on albuminuric neuro-retinitis in relation to the histological changes found in the kidneys post mortem. The ætiology of hyperpiesia is discussed at length, particularly in its relation to eclampsia and with regard to the possibility of its actual cause being a circulating pressor substance derived from the renal cortex, from protein decomposition in the intestinal tract, or from circulating bacterial toxins; experimental evidence in favour of these views is given. In short, the author's view is that the cause of hyperpiesia is a toxin of protein origin and pre-renal in its site of production, and this view is elaborated in an interesting comparison of some of the symptoms of hyperpiesia with certain phenomena observed in anaphylaxis.

The book merits close study, for it contains the result of exact clinical observation controlled by post-mortem examination; it is written with an independence of thought and with a critical spirit that holds up for re-examination on their merits both old-fashioned and modern views on such subjects as uræmia, albuminuric neuro-retinitis, and heart failure.

OCULO-ORBITAL SEQUELÆ.

Diagnosis, Treatment, and Survey. By Dr. F. TERRIEN, Ophthalmic Surgeon to the Beaujon Hospital, Paris. Paris: J. B. Baillière et Fils. 1921. With 67 illustrations. Pp. 276. Fr.16.

THE aim of the series of monographs, of which this is one, is to furnish the practitioner with knowledge concerning the sequelæ of wounds and illnesses of war-time as well as of industrial accidents, which will be of service to him clinically and also from the medico-legal standpoint. The frequency of wounds of the eye compared with wounds of other parts of the body was greater in the recent war than in any previous one, the percentage being 2·5. Of these the great majority were inflicted by small fragments of shells, bombs, or grenades, which accounted for 1585 out of 2000 cases of wound of the eyes, 408 being due to bullets, and only seven to bayonet-wounds. The result in the majority of cases was total blindness, with or without enucleation. In one series of cases the proportion of wounded eyes which, after a two months' sojourn in hospital, had vision no better than bare perception of light, was 60 per cent. At Verdun the proportion was considerably higher.

In this volume the commoner varieties of injury are dealt with in a manner not differing materially from that of the ordinary text-book. It is in the description of the rarer conditions that the author seems to warm to his work. The ætiology of traumatic enophthalmos, an excessively rare condition, evidently interests him. After criticising various theories of its ætiology, he supports the view that it is due to the tearing of the fibro-muscular envelope, known as the tarso-orbital fascia, which normally limits the action of the recti muscles in retracting the globe. As these cases are generally associated with orbital fractures, the enophthalmos often only appears at a late period after the absorption of blood diffused in the depth of the orbit. The chapter on cerebral lesions is interesting to compare with the conclusions of Gordon Holmes and others in this country as to the relation between the locality of the lesion and the alterations of the visual field. These are divided by Dr. Terrien into nine categories as follows: (1) and (2) Homonymous lateral hemianopsia, typical and atypical. In these cases it is usual to find a sensible diminution of visual acuity in the eye on the same side as the lesion, together with a much greater diminution of visual acuity in the other eye. The difference between the two eyes is not explained by the semi-decussation of the visual fibres unless we presuppose a difference of importance between the crossed and the direct bundles, a hypothesis which is rejected by Dr. Terrien on the ground that the difference is not constant. His own suggested explanation is that the macular fibres at their termination in the occipital lobe, instead of being localised as they are in the optic nerves, are spread out and enter into relation with the whole cortical visual zone; this theory would explain the diminished visual acuity in both eyes, but would hardly explain the difference between the two. (3) and (4) Inferior and superior horizontal hemianopsia. The former variety may result from bullet wounds traversing both occipital lobes horizontally above the occipital protuberance. The latter variety is excessively rare, as any similar horizontal wound below the protuberance must almost necessarily be fatal owing to the proximity of the lateral sinuses and the cerebellum. (5) Quadrantic hemianopsia. (6) Hemianopsic scotomata. These are actually more frequent than typical hemianopsias, but may easily escape notice. They may be macular, paramacular, peripheral, or annular. (7) and (8) Cortical blindness and concentric restriction of the visual fields. These are shock phenomena, rarely permanent. (9) Lastly, affections of the colour-sense independently of the visual field for white. These are excessively rare, but have occurred.

In the section on compensation the opinion of De Lapersonne is cited that the invalidity due to hemianopsia ought to be accounted greater than that due to the loss of one eye. The percentage of earning power lost is estimated at 36.

The book concludes with chapters on the re-education of the blind, on functional examination of the eye, and the detection of simulation, and on the estimation of compensation. At the end is an elaborate table giving the rates of compensation actually awarded by the laws of 1915 and 1919 respectively, not only for the loss of one eye, but for numerous varieties of diminution of visual acuity, hemianopsia and diplopia.

PULMONARY TUBERCULOSIS.

Its Etiology and Treatment. By DAVID C. MUTHU, M.D., M.R.C.S., L.R.C.P., Medical Superintendent, Mendip Hills Sanatorium. London: Baillière, Tindall and Cox. 1922. Pp. 381. 12*s.* 6*d.*

THE most prominent characteristic of Dr. Muthu's book on pulmonary tuberculosis is the philosophical breadth of his outlook. In his eyes it is a deplorable mistake that the study of the disease should be whittled down to a myopic scrutiny of a bacillus and the micro- and macroscopic changes in the animal tissues where this bacillus happens to be found. There are plenty of books devoted almost exclusively to the bacteriological and pathological aspect, but there are very few which take the broader view which includes such widely different subjects as heredity, environment, psychology, biochemistry, ethics, sociology, and a host of other subjects. It should be added that the author who attempts such a comprehensive survey is liable to draw an artist's, rather than an architect's, picture and, in aiming at colour as well as outline, is prone to ignore detail. This is a criticism which will probably occur to readers of Dr. Muthu's book, but as it is impossible to read it without gaining much general knowledge, not confined to pulmonary tuberculosis, this criticism is only partly justified.

There can be no doubt as to the author's attitude towards the comparative importance of the "seed" and the "soil." He says: "We must decide whether tuberculosis is an infectious or social disease. We cannot have it both ways. If it be an infectious disease, every measure of inoculation, injection, and antiseptic treatment would be both essential and successful. But while believing in contagion, we cannot consistently swing round and attack poverty, alcohol, bad housing, low wages, and other social evils." Probably most present-day authorities prefer to "have it both ways," but the author is doing useful work in focussing attention on tuberculosis as an insufficiency disease, only to be arrested or eradicated by "a radical improvement in the social, economic, and industrial welfare of the people." There are plenty of writers who take the other point of view, and this class will, no doubt, read with astonishment that "the presence of tubercle bacillus is not a decisive factor in the development of tuberculous

processes." With many years of sanatorium experience the author gives an excellent account of sanatorium treatment, supplemented by such adjuvants as continuous inhalation of a pharmacological pot-pourri, psychotherapy, and other remedies. It is doubtful if physicians will agree to his dictum that "no disease is so open to be readily influenced by suggestive treatment as consumption." For after all, there is a large element of organic disease in tuberculosis, be its functional manifestations never so prominent. Books on tuberculosis are incompletely reviewed if their authors' views on tuberculin—that much-gnawed bone of contention—are not mentioned. Dr. Muthu's contempt for it is quite undisguised.

A HANDBOOK FOR MIDWIVES AND MATERNITY NURSES. Fourth edition. By W. E. FOTHERGILL, M.A., B.Sc., M.D., Hon. Surgeon, St. Mary's Hospitals, and Professor of Obstetrics, Victoria University of Manchester. Edinburgh: W. Green and Son. 1921. With 67 illustrations in the text. Pp. 278. 15s.

Prof. Fothergill's book, already well known and appreciated by midwives, has now reached a fourth edition. It is based upon lectures and contains clear and simple teaching. The difficulty of writing a suitable text-book for midwives and nurses is obvious; most of those who attempt the task fail because they are over-ambitious and give too much information. Prof. Fothergill has avoided this error and his book well deserves the success it has attained.

NOUVEAU TRAITÉ DE MÉDECINE. Edited by G. H. ROGER, F. WIDAL, and P. J. TEISSIER. Fascicule IV. Paris: Masson et Cie. 1922. With 5 plates and 134 text-figures. Pp. 718. Fr. 40.

THIS great System of Medicine by 146 contributors, practically all French, is designed to fill 22 volumes. Of these this is the fourth in order and the fifth to be published. The chief articles are those on tuberculosis by Roger, syphilis by Nicolas, acute poliomyelitis by Dopter, lethargic encephalitis by May, rabies by Ferré, leprosy by Perrin, actinomycosis and aspergillosis by Laederich, and mycetoma, oösporosis, sporotrichosis, and blastomycosis by Langeron. These last will be of particular interest to English readers, since they deal with subjects which have largely escaped ample and systematic treatment in this country. The same may be said of Courmont on tuberculous septicæmia and Roger on the diverse kinds of pseudo-tuberculosis. There are also sections on glanders by Courmont and Dufourt, verruga by Guiart, and a useful summary of spirochætes in relation to man by Brumpt.

Throughout the volume more attention is given to laboratory detail than would generally be the case with us, and less to treatment; otherwise the treatise shows no special features, and on the whole the chapters are disappointing. The comparative absence of references to original literature is a deplorable feature. A few are given in footnotes, not infrequently to comparatively trivial articles, and on no obvious system. A work which when complete will presumably run to about 12,000 pages, cannot be a didactic students' handbook, and for more advanced workers some selected bibliography is really essential. Such references as are given are not always of much value. Thus for the resemblance between the bacilli of plague and pseudo-tubercle the reader is referred to Galli-Valerio's pioneer work of 1903, without any suggestion that the point has subsequently been worked out in much fuller detail by several investigators. The account of the histology and development of the miliary tubercle, though it spreads over six pages, is quite inadequate; it would have been better to refer to some modern text-book of pathological histology. In the same article the veteran Roger makes the curious statement that homoiothermic means cold-blooded (p. 161), and Mann's method of staining with methyl-blue and eosin is once more described as methylene-blue and eosin (p. 102) in the chapter on rabies.

Amalgamation of pathological and clinical aspects of disease is in every way admirable and desirable, but when it comes to small details it would be well that there should be some revision by practical experts. The System will no doubt be useful, but it hardly seems likely that it will become a standard book of reference.

JOURNALS.

QUARTERLY JOURNAL OF MEDICINE.—The January issue contains articles by the following authors: Archibald Malloch: A Study of Pneumonias and Types of Pneumococci. The types of pneumococci were investigated in 67 cases of lobar pneumonia admitted to a London hospital. The proportion of types found was very similar to those occurring in America, one-third of the infections being due to Type 1. The majority of cases of broncho-pneumonia showed pneumococci belonging to Type 4. Four cases of pneumococcal peritonitis were studied, and in each the Type 1 organism was isolated.—Carey F. Coombs: Streptococcal Infections of the Heart. The object of this investigation was to throw some light upon the ætiology of rheumatic carditis. The author has previously described the occurrence of nodules between the myocardial cells in the acute stages of rheumatic carditis, and to a lesser degree they are found in the endo- and pericardium. Although bacteria were not demonstrated in the nodules, he believes that these are the response to bacterial stimulation. In addition there is a pancarditis in which all parts of the heart are attacked by intracellular degeneration. In 20 cases of ulcerative endocarditis streptococci were found either during life or after death. The myocardial lesions in these cases were very slight, and probably embolic in origin. A study of sections showed that the endocardium, although usually infected from the surface, may at times be attacked from below, the organism being carried in the coronary blood supply. Probably in the majority of cases the streptococci are derived from the alimentary or respiratory tract, but in a few there is an obvious focus of infection, such as puerperal sepsis. Rabbits were inoculated intravenously with various types of streptococci, and in some instances cardiac lesions developed. These were mainly endocardial, and not limited to the valves. The author says that human rheumatic carditis is believed to be caused by the entrance of small doses of streptococci (of a virulence greater than that of the organisms concerned in the causation of chronic ulcerative endocarditis) over a limited period.—W. E. Hume, F. J. Nattrass, and A. F. B. Shaw: Twenty Cases of Encephalitis Lethargica with Pathological Findings in Four Cases. The authors describe an interesting series of cases of encephalitis lethargica. From a clinical standpoint emphasis is laid on the fact that optic neuritis does not occur, and if found the diagnosis of encephalitis lethargica should be held suspect. The pathological changes in the nervous system were, in the main, in accordance with the recognised histological findings in encephalitis lethargica.—Philip Crawford Conran: On Dropping of the Stomach—A Study Based on a Series of 150 Cases. Gastroptosis was found in 150 cases out of a total of 684 consecutive patients submitted to X ray examination at Duff House, on account of alimentary symptoms. It occurred three times as frequently in men as in women. The maximum age-incidence in this series was in the fifth decade. It was equally common in nulliparæ as in those who had borne children. In uncomplicated cases constipation was the most common symptom, but abdominal pain or discomfort was often noticed. Alimentary toxæmic symptoms were manifest in about 40 per cent. of the cases to a greater or lesser degree. The stomach was usually hypotonic, and delay in emptying was of frequent occurrence. In about half of the cases there was some dropping of the colon. Stasis in the ileum or the colon was the rule, but there was no evidence to show that gastroptosis favours the development of gastric or duodenal ulcer. The author finds that the most effective method of treatment is directed to the relief of the intestinal stasis.—H. S. Hutchison, assisted by S. J. Shah: The Ætiology of Rickets, Early and Late.

In this paper is detailed an important contribution to the study of rickets. In India, in the Nasik district, the population is divisible into two classes, the upper educated and moneyed, the lower uneducated and poor. The former have good food, rich in fat-soluble A vitamin, but the women and children are closely confined; the latter, for economic reasons, consume practically no fat vitamin, but lead an active life in the open air. Rickets is very prevalent in the former class, but is seldom met with in the latter. The logical conclusion is therefore that a vitamin deficiency is not the principal cause of rickets, but that lack of fresh air and exercise is a very potent causative factor. The evidence adduced strongly supports Dr. Leonard Findlay's views as to the ætiology of rickets.

AMERICAN JOURNAL OF OPHTHALMOLOGY. December, 1921.—The following papers are noteworthy:—F. A. Kiehle: Phlegmon of the Conjunctiva following Operation. This is an instance of a serious complication, ultimately involving the loss of the eye, following a simple operation for pterygium. No cause could be discovered.—G. E. Bellows: Gunshot Wounds of Brain with Visual Field Defects. Three cases are recorded with charts of the fields, which so far as they go support the conclusions of Holmes and Lister as to localisation in the visual cortex.—H. Gifford: Peripheral Iridotomy in the Treatment of Glaucoma. The author follows E. J. Curran in advocating a new operation for glaucoma, based on the assumption that the condition is in some cases due to want of communication between the posterior and anterior aqueous chambers. It is indicated in chronic cases where the anterior chamber is shallow and consists in making a minute peripheral opening in the iris. The results claimed are good, and the operation is so simple that the plea to give it a trial in cases where a more complete operation is contra-indicated (cases of strong tendency to ocular hæmorrhage, for example) is made with some confidence. The success or failure of the operation in attaining its object is seen at once by the deepening or otherwise of the anterior chamber. If a more radical operation is indicated later, its performance is not prejudiced entirely, but an accident to the lens might happen.—H. S. Gradle: The Present Status of Keratoplasty. The attempt to cure blindness due to corneal opacity by grafting a disc of clear cornea, either human or from an animal, has several times been made, but in the vast majority of cases the attempt has failed, the causes of failure being (1) suppuration, (2) failure of the implant to adhere, or (3) subsequent opacity of the implant. A new method of operating is here suggested suitable for a superficial opacity lying in the pupillary area, the periphery of the cornea being clear. With a large Von Hippel trephine an area of cornea is outlined excentric to the pupillary area but including it. This disc is then separated from the underlying clear cornea and, without being removed, is rotated on its own axis so that the opaque part is removed from the centre and replaced by the clear part. A single case in which this operation was performed is recorded, but the success was only very partial. It is obvious that this operation must be proved to be superior to an optical iridectomy before it can be recommended.—Henry Smith: Mature and Immature Senile Cataract. The author sets forth the advantages of his well-known intracapsular operation. He reminds the younger members of the profession that it is only for about 40 years that any extraction operation has been extensively performed, and incidentally wrongly refers to the late Sir Jonathan Hutchinson as the founder of Moorfields Hospital. The discussion that followed the reading of his paper showed that although Colonel Smith may count many American ophthalmic surgeons as his disciples, opinion is no less divided there as to the merits of his operation than it is in England. The main objection to it is that it increases the risk of vitreous loss; its great advantage that it does away with capsular membranes which so often require needling.

MEDICINE AND THE LAW.

The Law Relating to Inquests.

THE Home Secretary has stated in reply to a question in the House of Commons that it is intended to introduce a Bill into the House at once to deal with the holding of inquests by coroners without juries. Presumably this means that the experiment tried during the war, and since discontinued through the lapsing of the Act providing for it, is considered to have proved successful. The desire to prevent the incurring of unnecessary expense is now at least as much a matter for consideration as that of saving time and trouble to those summoned as jurors, while the holding of inquiries without juries renders it almost essential that coroners should have medical qualification, and such a provision would be unacceptable to many. In a further reference to the measure now being drafted Mr. Shortt said that the existing arrangements would be amended with a view to prevent duplication of proceedings in coroners' and magistrates' courts. A Bill, however, dealing with the whole subject of inquests is desirable.

A Physician Healing Himself.

The stipendiary magistrate at Liverpool dismissed a charge brought against a medical man apparently based upon his having obtained morphia and cocaine for administration to himself by writing and signing prescriptions. His defence was that he needed the drugs in order to treat himself for a painful disease and not because he was an agent for their improper use. The magistrate, after explaining the element of doubt, found for the defendant. He suggested, however, that druggists should tell medical men needing such drugs that they should obtain them through prescriptions signed by medical colleagues. This would hardly seem practicable. It is not for druggists to impose conditions on the sale of drugs not demanded by the law, and medical men must be able to get drugs supplied to them for use in the treatment of their patients. When a medical man is his own patient he has as much right to obtain the medicine that he prescribes as when the prescription is written by him for the treatment of any other patient.

Radiographs Objected to as Evidence.

In the Court of Appeals, Kentucky, U.S.A., unsuccessful defendants in an action for personal injuries appealed on the ground that radiographs of the plaintiff's injured limb were inadmissible as evidence because "as the photographed bones were covered with flesh, it was impossible to see them with the natural eye, and therefore to say with absolute certainty that the pictures were exact photographs of the conditions of the fractures." In dismissing an appeal which, in view of the use for many years of such photographs as evidence and for purposes of treating injuries, would appear to be somewhat belated, the court said: "When a Rontgen ray-machine is shown to make correct photographs under similar conditions to those in which the pictures in question were made, and that it was operated by an experienced and trained person in that line of work, who performed the work in such a way as to obtain a fair and correct view of the object photographed, and the photographs are correct copies of the plates made by the machine, there is no reason why they, like other photographs, should not be allowed to go to the jury as evidence in cases in which such evidence is relevant." This appears to lay down correctly the principle upon which radiographs are now universally admitted as evidence. The observation may be made also with reference to objections to their admission, that presumably defendants who dispute the extent of injuries suffered by a plaintiff, are everywhere given full opportunity to make their own examination of them, whether with the aid of photography or not as they may desire. The camera is not a partisan and the accuracy of its results is best tested by the use of another camera, an equally impartial witness.

THE LANCET.

LONDON: SATURDAY, MARCH 4, 1922.

An Imperial School of Hygiene.

IT was announced last week by the Ministry of Health that the Rockefeller Foundation had offered to provide the sum of £2,000,000 towards the cost of building and equipping an Institute of Hygiene in London, the offer being made on the understanding that the British Government would provide for its staffing and maintenance. The offer has been immediately accepted by the Ministry, to whom it was known that such generosity might shortly be proffered. It will be remembered that in the report of the Post-Graduate Medical Committee (the Athlone Committee), appointed by Dr. ADDISON, then Minister of Health, "to investigate the needs of medical practitioners and other graduates for further medical education in London," one of the important recommendations was that an institute of State medicine should be established by the University of London, in which instruction should be given in public health, forensic medicine, industrial medicine, and in medical ethics and economics. Sir ALFRED MOND, took up the suggestion with an expert committee, when the financial difficulties became apparent. These have been overcome, and there is now announced the possibility of erecting a School of Hygiene in London, which should immediately fulfil one of the particular needs indicated by the Post-Graduate Medical Committee of the Ministry.

But the act of the Rockefeller Foundation has a far wider significance than this, while to a great extent the fact that their offer followed the report of the Athlone Committee must be regarded as a coincidence. The Rockefeller Foundation, at least two years ago, had come to the conclusion, thinking in terms of world welfare, that the capital of the British Empire was fitly indicated as the seat of an international bureau of hygiene, and it would be ungrateful and ungracious of us not to acknowledge that this decision of the Rockefeller Foundation, on which action has now been taken, conveys a tremendous compliment to our Empire—a compliment which our Imperial attention to scientific affairs can hardly be said to have warranted. At the time that the Athlone Committee was sitting, the whole subject was being discussed, from the large aspect, by the Rockefeller Foundation, the Colonial Office being our obvious Government department to deal with many of the matters arising. Then the Athlone report threw a bright light on the deliberations by indicating that the Post-Graduate Medical Committee of the Ministry of Health had already approved of the placing of an Institute of Hygiene in London to serve the interests of post-graduates of every description. For the category of students, whose needs were being considered by the Athlone Committee, included all foreign graduates sojourning for short or long periods in London, qualified men living in this country or in any of our dependencies, officers of our Navy, Army, and Air Force, and any members of the Colonial Medical Service who were enjoying study leave. An Institute of Hygiene which should minister to such a constituency will be seen at once to serve the common needs of the medical services of the Foreign Office, the colonies, the India Office, the combatant forces, and the Ministry of Health, and also those of students, duly accredited from the medical centres of the world. And it is in this way that the central Institute of Hygiene, which has now been made a near possibility in London by the generosity of the Rockefeller Foundation, must be regarded. The Institute is being started to meet international and national needs, and as a definite recognition by the United States that the constructive side of British Imperialism can be used to the advantage of the whole world.

The money provided by the Rockefeller Foundation will build and equip a central institution worthy of so fine an outlook; and this is saying a good deal, when we consider what prevention of disease in its large sense means, and what activities of prevention fall particularly to an Institute of Hygiene. There will be departments of applied physiology and biochemistry, of immunology and bacteriology, of medical zoology, of tropical pathology, epidemiology, and their related statistics; and lastly, there must be a department of general sanitary administration where medical men selecting hygienic medicine as a career can receive routine instruction. The new institute should become a focus for the spread of benefits which are applicable to citizens of all races and all climes, and it is a great thing that it should be placed in our metropolitan city. A brief allusion, however, must be made to the one outcome of the generosity of the Rockefeller Foundation which will be causing uneasiness. Existing schools and faculties for education in hygiene may suffer unfairly unless their interests are guarded. This is a point which we press on the consideration of the Government.

The Theory and Practice of the Schick Test.

WHENEVER a new set of facts in any particular branch of medical science comes within the scope of our knowledge, a readjustment of mental outlook becomes necessary. Such a readjustment is now taking place in immunology on the question of diphtheria and the Schick test. The positive Schick test in a normal person postulates that the patient's serum is deficient in natural antibody; and we are entitled to ask ourselves whence comes this natural antibody. In a paper by Dr. T. E. DICKINSON, published in THE LANCET of Feb. 18th, a statistical table shows that of children up to 6 years of age not suffering from diphtheria the greatest percentage of positive reactions occurs between the third and the fourth year of life; and the author goes on to point out the significant fact that this age-period coincides with the age-period when the incidence of clinical diphtheria is most marked. Sir FREDERICK ANDREWES, again, speaking to the Society of Medical Officers of Health, as reported in our last issue, said that "published figures, mostly dealing with the poorer classes, showed that 80 per cent. of infants at birth had a passive immunity derived from their mothers, which quickly faded, till at 3 years of age the figure was 28 per cent., which rose again to over 80 per cent. at 18 years and in adult life." Here, therefore, we have presented a question of heredity and immunity which is well worth further experimental research. Is the natural immunity to diphtheria possessed by the majority of children acquired as the result of the bacterial environment in which they are placed or is it a true hereditary transmission? Closely allied to this question again is the one recently raised by Dr. W. W. C. TOPLEY[1] as to whether the production of a temporary passive immunity during the course

[1] THE LANCET, Feb. 4th, 1922, p. 228.

of an infection prevents the acquirement of a more permanent active immunity resulting from the response of the tissues to toxins or other bacterial products. Further research is also required in order to explore more extensively the question of the specificity of the Schick test. Dr. DICKINSON, for example, has shown that toxic individuals tend to give a negative reaction as evidenced by the results of the Schick test in cases of scarlatina anginosa; and another interesting fact brought out by him is that cases of enteric fever and erysipelas, and persons who have been inoculated with typhoid and dysentery vaccines, tend to show a high pseudo-positive reaction-rate. From these isolated facts it would be inadvisable to draw very definite conclusions, but they raise the interesting question of the relation of the true and, presumably, specific diphtheria toxin to the non-specific bacterial toxin, a point which was brought out years ago by the VAUGHANS in their work on protein split products.

On the practical side the Schick test raises yet another crop of important issues. For example, the results of any widespread application of the test would be worthless if the potency of the toxin used could not be guaranteed. It has been customary in the past to add 0·5 per cent. phenol to the saline used for making toxin dilution for the Schick test. But according to Mr. A. T. GLENNY, such carbolised dilution is extremely susceptible to mechanical agitation. At a meeting of the Pathological Section of the Royal Society of Medicine on Feb. 21st he gave the results of elaborate investigations which established the instability of the toxin under certain conditions. When the bottles containing the dilution are not completely full, the toxin loses about 50 per cent. of its potency if carried during a walk of 250 yards, about 75 per cent. if carried for half a mile, and all toxicity has disappeared after a journey of a mile. A loss in potency of 25–50 per cent. was demonstrated in toxin carried rapidly up two short flights of stairs. If the dilution containing phenol is carried in bottles completely filled, it is relatively stable. In the absence of phenol, however, no appreciable loss is detected, even in half-filled bottles subjected to such mechanical disturbance as occurs during a long walk or journey by 'bus or when conveyed by post for long distances. Since very dilute solutions of antitoxin are also affected by shaking, it is obvious that careful precautions will have to be observed if the agents used in the Schick test are to be brought into general clinical use with potency unimpaired. Meanwhile, the exact physico-chemical factors, involved in the increased lability of dilutions made with phenol and other agents which lower the surface-tension, are being examined. The significance of this diminution in toxicity, in connexion with the cases reported of diphtheria occurring in a Schick-negative person, will occur to everyone. Since the whole basis of the test depends on the guarantee of immunity to these individuals, it is important to make the fullest investigations of such cases; the diminished potency of the toxin used in the original test may be found to account at least for some of them. On the whole, however, the Schick-negative case offers less possibilities of error, as far as can be ascertained at present, than the Schick-positive case.

The relation of positive reactions to carrier cases has recently been dealt with in a communication to the Chief Medical Officer of the Ministry of Health by Sir GEORGE BUCHANAN and Dr. MONCKTON COPEMAN.[2] If the test can be made to supplant the tedious method of swabbing contacts, and subsequently dividing them into virulent and avirulent, much valuable labour and expense will be saved; and if, as this report suggests, a definite code for the effective prevention of the spread of diphtheria, such, for example, as we may be said now to possess in the case of enteric fever or small-pox, can be evolved, it will be a triumph for all those concerned in preventive medicine. One of the initial difficulties has been the definition of the carrier. If we remain content to assume that a carrier is merely a person who discharges diphtheria bacteria from nose and throat we shall probably not progress far. A number of points need to be investigated before a person is written down as a possible rock of offence to his friends and neighbours. For one thing, far more care should be exercised in the minute and systematic routine examination of the upper respiratory tract for small local lesions. If there is no discoverable lesion we should ascertain whether the bacteria are being discharged intermittently or continuously over a long period of time; whether the organism is a definitely recognisable member of a pathogenic group (atypical forms are not uncommon); and finally whether it is virulent to an experimental animal. Anyone who knows the haphazard way in which throat swabs are examined in some institutions will hesitate to dogmatise on the anticipated danger. Finally, what action should follow the Schick test? This appears to be the most important question of all. Unfortunately our experience of the toxin-antitoxin mixture is less than that of the Schick test, and there are rocks ahead, as the discussions already quoted showed. The method of administration and the choice of the opportune time for giving the toxin-antitoxin mixture, the bearing of this upon second attacks—these and other problems have yet to be faced. One thing however, seems clear: at last we see a way out of the forest of the diphtheria-carrier question; the choice of the most accessible path is merely a question of time.

[2] THE LANCET, Dec. 10th, 1921.

The Radium Institute.

THE report of the London Radium Institute for the year 1921 shows that work is being actively pursued there in practically every branch of radium-therapy. The Institute was opened in August, 1911; large numbers of patients have been treated during this period of ten years, and in the first part of the report, Captain A. E. HAYWARD PINCH gives a useful review of the probabilities which may now fairly be put to the medical profession as to the benefits to be derived from treatment with radium. While it is true that the dominant interest in this form of therapy is in its application to malignant disease, nevertheless, many other distressing conditions are amenable to the rays from radium. Captain PINCH does not hesitate to mention also those diseases for which he has reason to believe radium-therapy is useless. With no less justification he condemns statements in the press that radium is a failure in the treatment of cancer. Such statements imply a limited acquaintance with the subject, and although untrue, they do as much harm as assertions of unbalanced optimism. The use of radium in diseases of women and the relative advantages of radium and of X rays in various types of cases are thoroughly discussed. Captain PINCH has himself been practically responsible for the whole of the gynæcological treatment at the Institute since it opened, and his personal experience will be of value to the medical profession at large. It may be taken as proven that in these diseases a wide and growing sphere of usefulness exists for both of these agents under expert direction. We do not know why the physical nature of the gamma rays should

be questioned any longer, for there is no more doubt as to the nature of these rays than of daylight. The report from the Pathological Research Laboratory, under the direction of Dr. J. C. MOTTRAM, deals with a number of investigations of considerable interest. We may refer especially to the collaborate work with Dr. W. CRAMER and DR. A. H. DREW of the Imperial Cancer Research Fund. The attempt is being made to correlate the similarities observed in animals when they are exposed to large doses of X rays or radium and when deprived of B-vitamin. The mode of death is strikingly similar under these different experimental conditions. Further investigations will be awaited with interest in view of the possible therapeutic indications which they may afford. The report of the Chemico-Physical Laboratory under the direction of Mr. W. L. S. ALTON, F.I.C., gives a brief summary of the various tubes and applications used during the year, and deals in some detail with the various devices which have been brought into operation for the safety of the personnel. It is a difficult matter to protect those handling radium from the penetrating gamma rays, and it will be noticed in this report that protection by distance is held in many cases to be more efficient than that afforded by metallic screens. The report is of modest dimensions and should be read as a whole; a copy of it will be sent post-free to any medical practitioner who applies to the Secretary of the Institute, Riding House-street, London, W.1.

THE SHEPHERD'S BUSH ORTHOPÆDIC HOSPITAL.

THE Military Orthopædic Hospital at Shepherd's Bush has occupied for the past six years buildings belonging to the Hammersmith guardians, and previously used by them as a general hospital for the poor of the neighbourhood. Naturally the guardians are now pressing for the restitution of their hospital beds, and the Minister of Pensions proposes to transfer the orthopædic pensioners to the South African Hutments Hospital at Richmond. The generous equipment of apparatus provided at a cost of £16,000 by the Red Cross would on this proposal not accompany the in-patient pensioners, but remain available for the continued treatment of out-patient pensioners somewhere in the London area. The proposal is being strongly resisted by the present staff of the Orthopædic Hospital, who see in it the break-up of one of the most successful pieces of medical team-work which the war produced, and many questions have been asked in Parliament. Mr. Macpherson, for the Pensions Ministry, stated that in his opinion the transference of staff and equipment to Richmond would be in no way detrimental to the patients, but, seeing that the time of the visiting staff is now fully occupied, while they will have six miles further to travel, they will obviously have less time to devote to their actual work, and medical opinion will hardly share the Minister's comfortable view. Moreover, from the segregation of in- and out-patient treatment some duplication of apparatus must needs result, inasmuch as in-patients at Richmond cannot be allowed to suffer for the lack of facilities left behind at Hammersmith. We doubt whether the plea of economy will be found valid on further careful investigation. But there is another point of great importance which should not be lost sight of. A process of specialisation is gradually taking place in the Poor-law hospitals of London, and it would seem peculiarly distressing to disband for a doubtful and momentary gain what might form a permanent and altogether admirable orthopædic Poor-law unit. We trust that before the decision has become irrevocable the Ministry of Pensions and the Ministry of Health will consult their common interest in this matter and take the long view which combines efficiency with economy.

Annotations.

"Ne quid nimis."

THE IDEAL CLASSROOM.

THE ventilation, lighting, and heating of classrooms were the subjects of discussion at a meeting of the Association of School Medical Officers held on Feb. 22nd, when Mr. G. H. Widdows, F.R.I.B.A., asked for a considered medical opinion on some controversial points. Assuming, with Dr. Leonard Hill, that in ventilation the primary need is a physical and not a chemical one, Mr. Widdows asked how much ventilation is necessary? It had been shown that with 10 sq. in. of hopper opening per child on one side as inlet and a similar amount as outlet on the other side, and with a wind pressure of no more than four miles per hour, the air in a classroom could be changed 10 times per hour by means of hoppers only. Was that sufficient? As to lighting, could it be proved that conflicting shadows, inevitable if the light came from more than one side, were harmful to the eyes? Again, was the admission of sunlight into classrooms desirable? In the matter of heating, what was the ideal system? With open fires the children near the fire got too much heat, and those at the back of the room did not get sufficient. High pressure hot water had its drawbacks by reason of the coils burning out, and by reason of the high temperature of the pipes. Mr. Widdows suggested that low pressure hot water would appear to be the most serviceable in ordinary buildings. He drew attention to heating of the North Wingfield school by means of hot pipes under a concrete floor composed of floor slabs 2½ in. thick resting on a concrete grid. He dwelt on the economical advantage of thin walls in school buildings, provided there were no hygienic drawbacks to their adoption, and praised the convenience of folding-tables to seat two, four, or six children in place of the rigid sloping desk.

If we may assume that Mr. Widdows was sincere and not merely complimentary in his expressed desire for medical opinions on these points, he must have suffered some measure of disappointment in the animated discussion following his paper. For while his own professional colleagues, educationists and engineers, rose in quick succession, the last two speakers only were members of the Association he had come to consult. All expressed admiration for the beautiful schools built throughout Derbyshire to his plans, and many openly envied the opportunities for experiment granted to him by an enthusiastic county council. Mr. Gaster, of the Illuminating Engineering Society, asked what amount of illumination was desirable in a classroom and what ill-effects were produced if it did not reach the minimum standard required. Dr. E. H. T. Nash pleaded for a better place for the blackboard than is usually accorded to it in a classroom, and pointed out that a reflecting wall painted a suitable colour is of more advantage than any attempt to borrow light from a neighbouring room or corridor by a glass partition. Dr. J. Kerr, who presided over the latter part of the meeting, Mr. R. C. Elmslie having been called away, summed up the medical aspect of some of the questions raised. He congratulated Mr. Widdows on having successfully and completely separated the two problems of ventilation and heating which should always be kept distinct one from the other. The specific heat of air was so small that it was expensive as well as undesirable to carry heat by air. The need of unilateral lighting depended on the sizes of windows. If the light came from a large diffused surface without sharp shadows, its source was less important. But if in a comparatively dark room, where the eye was adapted for darkness, light came from two opposing sources, with conflicting shadows, strain and neurasthenia might result. Similarly, streaks of sunlight were undesirable in a classroom. Sloping desks Dr. Kerr regarded as obsolete, being relics from the time when a rigid

posture was demanded of the school child. Many points raised by Mr. Widdows remained undiscussed from the medical aspect, but in view of their importance it may be hoped that they will receive the earnest attention of those whose duty it is to interpret the results of recent research to responsible authorities.

THE CLASSIFICATION OF BACTERIA.

BACTERIOLOGISTS concerned with the examination of water and milk have always felt the need of some form of classification which will differentiate organisms of the *B. coli* group into those of human and those of animal origin. Apart from the helpful work of W. M. Clark and other American workers on essential differences of origin of organisms with different carbon dioxide to hydrogen ratio of gas production, little or no advance has been made in this direction during the last two decades. It is easy enough to classify by sugar-alcohol tests, but unless it can be shown that the groups so formed throw definite light either upon the functions or the sources of origin of bacteria the classification is not of much use for public health purposes. In a recently published paper[1] Mr. T. Redman, M.Sc., records the results of painstaking work in the classification of lactose-fermenting organisms of the *B. coli* group type. He has isolated these micro-organisms from cheese, milk, and water, and has endeavoured to group them along the lines of their cultural and agglutination characters. From the public health standpoint Redman's laborious efforts cannot be regarded as very helpful, for he closely follows MacConkey's method of classification, which has not been of demonstrable use. A considerable part of the paper is taken up with a study of agglutination tests, a large number of strains being used to prepare anti-sera. Here again these tests fail to give any clear-cut types, and although the author states that the strains differentiated into MacConkey's subgroups by cultural reactions are also differentiated by their agglutinations, the tables furnished show that this is only true to a very limited extent. We await with some anxiety the day when an ingenious student of applied bacteriology will invent a means of classification which will give information of real practical value.

PACHYMENINGITIS HÆMORRHAGICA INTERNA.

THE cause and nature of the pathological process in pachymeningitis hæmorrhagica interna, and the relation of this condition to traumatic subdural hæmatoma, have always been subjects of much diversity of opinion, and nowhere in the text-books dealing with them do we find any final conclusions expressed. At present two hypotheses hold the field: the first that the lesion is primarily inflammatory—a true pachymeningitis followed by repeated small secondary hæmorrhages from the newly-formed blood-vessels of the organised exudate; the second that hæmorrhage is the essential factor and is followed by organisation of the clot.

In the current number of *Medical Science* (1922, v., 496), Dr. F. M. R. Walshe discusses two important and relatively recent papers in which both points of view are represented. At the Seventeenth International Congress of Medicine of 1913, held in London, Marie, Roussy, and Laroche discussed the morbid anatomy of pachymeningitis hæmorrhagica interna. They described three main forms of lesion, with several subtypes. However, since in the great majority of their cases the diagnosis was made at autopsy, the condition having been latent clinically, no information was available as to the age of the lesion in any given instance. This clearly diminishes the value of their observations and conclusions, and we are left with the impression that their classification is largely conventional and does not represent variations in a pathological process, but rather different stages in a more or less uniform process. In addition they carried out experimental observations on animals by subdural injections of blood, either sterile, infected, or mixed with a chemical irritant. They failed to reproduce typical pachymeningitis hæmorrhagica. This is not altogether surprising for their experiments were acute and completely neglected the essential time factor. However, they concluded that hæmorrhage alone is not enough to account for pachymeningitis hæmorrhagica in man and that a microbial or chemical irritation is essential, but without indicating how either arises. In 1914 W. Trotter published in the *British Journal of Surgery* what appears to be the most conclusive statement on the subject. He emphasises the importance of the time factor in determining the symptomatology of a nervous lesion. He points out that most progressive lesions produce their effects not by destruction of tissue but by interference with its blood-supply. In head injuries hæmorrhage and œdema are the factors leading to disturbances of cerebral function, and the rate at which these processes impair the cerebral blood-supply determines the nature of functional disorder resulting. He contrasts rapid compression of the brain from traumatic extra-dural hæmorrhage with the gradual compression occurring in subdural hæmatoma. In the former case the hæmorrhage is clinically latent until compression reduces the total venous capacity of the skull below that of its arterial blood. At this point venous engorgement results, with the appearance of increased excitability of nervous tissue and corresponding "irritative" symptoms—twitching of muscles, convulsions, delirium, and restlessness. Further compression produces capillary anæmia of the brain and paralysis of function in the affected part.

In gradual compression, such as occurs in subdural hæmatoma, a physiological compensation or toleration ensues, and hence no symptoms may be observed until a local anæmia is produced. Once the margin of toleration is reached the patient passes suddenly into a state indicating severe compression. Even normal variations in intracranial tension may be sufficient to cause startling symptoms to develop with great suddenness, and as rapidly to clear up. Trotter then compares the symptomatology and morbid anatomy of traumatic subdural hæmatoma and pachymeningitis hæmorrhagica and shows clearly that they are identical. He believes that the source of hæmorrhage is in the veins passing from the cortex into the dural sinuses. Trivial blows on forehead or occiput may be sufficient to tear these relatively unsupported vessels, from which intermittent oozing can go on for an indefinite period. The periphery of the blood mass clots and organises, leaving a fluid cyst into which further hæmorrhage takes place whenever venous pressure rises sufficiently to overcome the resistance of the enclosing capsule. The absence of a history of head injury in many cases of pachymeningitis hæmorrhagica is not a grave objection to this point of view, for since trivial injuries are most likely to be in question they are apt to be forgotten by the senile dements and alcoholics in whom the condition is found, and who are especially prone to accidents of the kind. Therefore Trotter concludes that internal pachymeningitis hæmorrhagica is a term which involves an unjustified hypothesis and should be discarded in favour of some such term as chronic subdural hæmorrhage. Apart from certain cases occurring in diseases which cause a strong tendency to spontaneous hæmorrhage, and possibly including them, hæmorrhagic pachymeningitis is a true traumatic hæmorrhage coming from veins torn in their course between brain and dural sinus. It should always be dealt with surgically. Finally, the variable and capricious course of such chronic hæmorrhages, far from rendering diagnosis exceptionally difficult, is capable of exact interpretation in accordance with the principles of cerebral pathology, and constitutes a clinical type at once well marked and characteristic. Marie, Roussy, and Laroche found that in almost all their cases the condition was bilateral, and this also has been Trotter's experience, and he believes that surgical treatment should deal with both sides of the head simultaneously.

The charm of Trotter's lucid exposition is its strict adherence to sound pathological principles. The train of events he describes is eminently comprehensible and leaves less unexplained than any previous discussion of

[1] Journal of Pathology and Bacteriology, 1922, xxv., 63.

the subject with which we are familiar. The conception that the site of a nervous lesion is of infinitely greater importance than its nature and mode of development is doubtless a valuable one, but in the past it has led neurologists to neglect the physiological aspect of disease and injury of the nervous system. In its reassertion of the physiological principle, Trotter's paper has a value even greater than as an illuminating exposition of a particular problem in neuropathology.

EXPERIMENTAL TRANSMISSION OF TYPHUS TO MAN.

A RELATED account of some interesting observations which were interrupted by the war has recently been published by E. Sergent, H. Foley, and Ch. Vialatte.[1] In November, 1913, a young native was brought to the hospital at Beni-Ounif, southern Algeria, suffering from an attack of fever of six days' duration. Here he came under the observation of the authors, who diagnosed his complaint as relapsing fever on the finding of spirilla in the circulating blood. On the following day a typical crisis occurred, the spirilla disappeared from the blood stream, and recovery was looked for. A fresh accession of fever, of a continuous nature, occurred however, accompanied by signs of consolidation in the right lung. Examination of the blood for spirilla and typhoidal infection was negative, and after eight further days of illness, in which the general condition further deteriorated and the typhoid state finally supervened, the patient died. Being engaged in an investigation of the transmission of relapsing fever by means of lice, Sergent, Foley, and Vialatte inoculated, by scarification, the material obtained by crushing nits from the garments of this patient into a second native (Z), who volunteered for this purpose. Another volunteer (Y) was inoculated in the same manner with crushed lice, and a batch of 200 lice from the same source were nourished upon the body of a fourth native (X). On the fifth day after inoculation Z was taken ill with a continued fever lasting 13 days, accompanied by intense headache, delirium, constipation, and albuminuria, and terminating by crisis associated with collapse; recovery followed. Subject Y developed the same malady after eight days' incubation, whilst the host of the lice fell a victim to the disease after nourishing these creatures for 16 days. In all cases recovery followed. The disease was typhus fever, which apparently evolves in a milder fashion in the natives of this area than in Europeans. One of the authors, who was closely associated with the patients but not subjected to experiment, contracted the disease in a severe form, fortunately recovering. The extremely interesting facts detailed in this paper leave little doubt that the original patient, from whom the infected lice were obtained, was suffering both from typhus and relapsing fever. He had come from an outlying district, where he probably contracted the disease, and brought the infection to Beni-Ounif, where typhus had not been seen for several years prior to the time at which these experiments were carried out. This fact probably emboldened the authors in their experiments, since they believed themselves to be dealing with a pure infection with relapsing fever. The fatal termination of the case was a disturbing fact and was at first attributed to pneumonia, a very uncommon complication; typhus was not thought of until the three inoculated subjects went down with the disease. Confirmation of the diagnosis was obtained by transmission to monkeys by means of the infected lice, carried out at the Pasteur Institute of Algiers, and also by the appearance of *Rickettsia* in the bodies of the involved lice, which were being examined in routine fashion for spirilla. The occurrence of debased forms of typhus is a matter of the greatest importance from an epidemiological point of view and is one of the many points emphasised by the interesting, though entirely unlooked for, results of the above experiments.

[1] Arch. des Inst. Pasteur de l'Afrique du Nord, vol. i., 3, 1921.

TRAUMA AND SYPHILIS.

Dr. I. Harrison Tumpeer,[1] associate professor and head of the department of pædiatrics of the post-graduate school of Chicago, who records two personal cases, quotes several examples from recent literature illustrating the action of trauma in exciting active lesions on the predisposing soil of syphilitic infection. It is well known that syphilitic patients have a marked tendency to fractures, this being due, as Coues has shown by X-ray examination, to the presence of old periostitis. The tendency of gummata to occur at the site of repeated traumatism has been best exemplified by Lacapère and Laurent, who treated 40 cases of gummatous lesions in the dispensary at Fez, Morocco. Fourteen of these were on the forehead, this localisation being explained by the Mohammedans' custom of prostrating themselves on the stone floor of the mosque five times a day with their brow in contact with the floor from 10 to 20 minutes at a time. Some cases of general paralysis have been acutely precipitated and others adversely influenced by cranio-cerebral injury, which permits the spirochætes to invade the brain tissue by causing vascular injury and brain destruction, followed by gliosis and nerve-cell sclerosis. The cases reported by Dr. Tumpeer occurred in a half-sister and brother. The girl, aged 15, with hereditary syphilis possibly of the third generation, developed epileptiform seizures and mental disturbance after a head injury which produced coma, while her half-brother, aged 10, developed primary optic atrophy after a similar trauma, and the healing of a fracture caused by the same trauma was much retarded.

[1] Journal of the American Medical Association, Jan. 21st, 1922.

RUMINATION IN INFANTS.

WHILE the comparatively scanty references to this condition in medical literature may suggest its rare occurrence in infancy, the fact probably is that a large number of cases, especially of the milder type, are overlooked. On the other hand, however, some writers apparently include under rumination cases of simple regurgitation, whereas the term should, of course, be confined to those in which there is renewed mastication of the regurgitated food. Dr. W. Wernstedt, who in 1916 described a somewhat remarkable instance of rumination in an infant of 10 months, writing in the *Acta Pædiatrica* about a year ago, gave details of six other cases seen by him since 1918. The essential movements involved have hitherto been little studied, nor has it been established how far the act is voluntary or otherwise. With regard to the latter point, Dr. Wernstedt convinced himself in two of his cases that the strong abdominal contractions preceding regurgitation of the food were apparently involuntary on the part of the infant. An interesting point was the fact that in one of these cases the X rays showed the cardiac orifice to remain patent while the food rose and fell in the dilated œsophagus; this cardio-insufficiency was not, however, demonstrated in all the patients. In one or two cases the infant was seen to make an effort to initiate the regurgitation, mainly by movements of mouth or tongue, the abdomen remaining flaccid. In yet another case the child apparently voluntarily regurgitated the contents of its stomach by momentary abdominal contractions, thus raising the intra-abdominal pressure, the mouth and tongue at the same time assuming the position seen in vomiting. In the second phase of rumination, after the food has been regurgitated, the movements are no less diverse and complex, ranging from a rhythmical chewing movement of the jaws to a gargling at the back of the tongue.

Discussing the ætiology of the condition, Dr. Wernstedt believes the importance of the neuropathic element usually assigned to it to be exaggerated. In two only of his cases was there any evidence of nervous instability, such as tremor or spasmophilia, the remaining patients being apparently normal in

this respect. On the other hand, vomiting, either occasional or habitual, is probably a more or less constant ætiological factor, and may at first be the only symptom noticed by the mother. In some cases the vomited contents of the stomach may be seen after a time to be swallowed again, and later still to be chewed before being swallowed, this chain of developments being possibly more common in cases of rumination than is generally supposed. Dr. Wernstedt is inclined to ascribe the whole symptom-complex of rumination to the pleasure that the child evidently derives from the habit, a pleasure probably acquired by degrees, and not necessarily associated with any neuropathic perversion or taint. As to treatment, medicinal therapy seems to be of little use, but Dr. Wernstedt has had some success with the giving of more solid food. In some cases this effected a cure, while in other cases the rumination itself had first shown itself after the patients had been on solid food for some time. Psychotherapy, chiefly in the form of distracting the child's attention in various ways, apparently offers the best hope of a cure, and a combination of this with a change in the dietary is possibly the ideal form of treatment in this troublesome condition, which in severe or protracted cases leads only too often to death from malnutrition and cachexia.

A SIX-YEAR PREGNANCY.

A CORRESPONDENT has forwarded to us recently a story from Constantinople of a young woman in that city who is supposed to have carried about for years an unborn child in the uterus. She had been married for six years, and soon after her marriage believed herself to be pregnant, but as no child was born she concluded she had made a mistake. Recently she consulted a doctor for what she thought was an abdominal tumour and learnt to her great surprise that she had been carrying an unborn child for six years. She was apparently operated upon, and the local surgeons are reported to have been very proud of their success. In old medical literature cases of supposed long retention of the fœtus in utero are not at all uncommon, and fœtal retention for periods as long as 30 to 40 years is recorded. Meigs relates a case in which the uterus was found to contain the remains of a fully developed fœtus minus the portions which had been discharged through a fistulous communication between the uterus and rectum, a case no doubt of posterior subperitoneal extra-uterine gestation; and a similar explanation—viz., that they are all instances of retained extra-uterine gestation—will account for the marvellous stories of the older writers in which the fœtus was supposed to have been retained in the uterus for many years. One of the most puzzling and interesting of all abdominal tumours is that resulting from the retention, possibly for very long periods of time, of an extra-uterine gestation. There is a specimen of this kind in the Museum of the Royal College of Surgeons of England from a case recorded by Cheston in 1814. In 1738 this patient was in labour with her fourth child, and the doctor wished to apply the forceps to effect delivery; to this the woman, however, would not agree. The child did not come away, and the patient survived for 52 years, dying at the age of 80 years. At the autopsy the specimen, a lithopædion, was found embedded in the pelvis. The interesting cases in which portions of, or even whole fœtuses have been extracted from an abscess cavity in the anterior abdominal wall are, doubtless examples of anterior subperitoneal fœtation in which the sac has become infected. There is the historical case of the young woman who, seven years after she thought she had become pregnant, suffered from a tumefaction of the abdomen; this burst, and the elbow of a fœtus protruded from the wound. The assistance of a friendly butcher was invoked, who enlarged the wound and extracted the head of a fœtus together with the broken-up skeleton and some decomposing material from the abdominal cavity, the woman making a good recovery. Kimura records a similar case in a Japanese woman, in which the arm of a fœtus made its appearance through the abdominal wall just above the umbilicus; the fœtus was removed by traction after the opening had been enlarged.

It would be easy to collect many cases of a similar kind both from old and recent medical literature. At one time there was quite a vogue in the Southern States of old negress impostors who pretended that they were examples of long-continued pregnancies, and gave exhibitions of the fœtal movements to prove their authenticity, one actually pretending to show the fœtus dancing, with rhythmical movements, to the music of a banjo. When we remember how, even at the present day, perfectly sane women may be persuaded that, at or after the menopause, they can feel fœtal movements in a phantom tumour, such impostures are easier to understand.

COMPOUNDS OF BORON AND POTASSIUM IN EPILEPSY.

Prof. Trocello, surgeon-commander in the Italian navy, and lecturer on nervous diseases in the University of Rome, reports in the *Annali di Medicina Navale* for December his encouraging experiences in the treatment of epileptic lunatics with tetratartrate of boron and potassium in place of bromide of potassium. Bromide of potassium, as he says, has been used in the treatment of epilepsy ever since 1851, but in view of its tendency to cause skin eruptions and serious nervous depression, is not wholly satisfactory. About 1880 Gowers and other English authors recommended that borax should be used instead, but after a time borax was found relatively ineffective. In 1920 Pierre Marie and others reported that the tartrate of boron and potassium had more effect than the other salts containing boron and was, moreover, less toxic. According to these observers, it reduced the frequency of the seizures and diminished their severity; attacks of giddiness only in many cases replaced the actual fits, or these did not develop further than the aura. McCartney, as a result of his obervations on 42 patients, recommended sodium biborate. In January, 1921, Gardère and others reported that they had been giving 3 to 15 g. of the tartrate daily to epileptics, whose attacks decreased in frequency, while their general health and mental condition improved, though attacks of giddiness were at first a little more numerous; they noted that with a reduction in the dose the attacks again became more frequent. Grassi in 1921 found the salt of great value in treating children. Prof. Trocello has himself used it in eight cases in an asylum, of whom four appear to have ceased having attacks, while the other four, though their fits did not cease, were in so far improved that they behaved better and were less violent. The salt must be reasonably pure—one physician, dissatisfied with results, had his stock of the drug examined and it was found adulterated with 95 per cent. of bicarbonate of soda.

MALIGNANT CHORDOMA.

THOSE who are interested in the rarer sorts of tumours—and a knowledge of the existence of curiosities is the first step towards discovering that they are commoner than is supposed—will find a useful account of a malignant sacrococcygeal chordoma by Prof. M. J. Stewart of Leeds in the current *Journal of Pathology and Bacteriology*, which we reviewed in our last issue. The patient, aged 65, had a slowly-growing solid tumour over the coccyx which in eight years had reached the size of an orange. It was then excised and thought to be a colloid carcinoma of peculiar type. Five years later a diffuse mass of growth appeared in the left buttock and three years after a nodule over the right scapula. The man eventually died at the age of 76; the tumour in the buttock had caused great destruction of the femur and ilium, but there was no general dissemination. These tumours arising from the notochord are evidently rare. It appears that this is the first to be recognised—or at any rate described

—in this country, and Prof. Stewart has found in the literature only 25 other examples which gave rise to clinical symptoms. Nearly all occur either in the neighbourhood of the spheno-occipital synchondrosis or in the sacrococcygeal region. Benign and malignant forms are known and the latter are usually of slow growth and, though they recur after excision, general metastasis is quite exceptional. Histologically, the tumour is alveolar in arrangement: the cells of the parenchyma are epithelial in type and early undergo a mucoid change in the cytoplasm which ultimately progresses to an extreme degree. Some clear illustrations and a copious bibliography complete a small monograph which should lead to the recognition of further instances of this interesting condition.

ECONOMY IN INFORMATION.

WE learned with regret that the *New Zealand Journal of Health and Hospitals*, published at Wellington, was discontinued after the issue of December, 1921, "as a result of the necessity for economy in all Government undertakings at present." In an announcement of the impending doom the editor has laid just claim to fulfilment of a useful purpose in circulating amongst the health authorities of the Dominion morbidity statistics and figures relating to infectious diseases throughout New Zealand, together with information concerning hospital administration, and news of health activities in other countries. Through public libraries and by means of quotations in the daily press the *Journal* has also conveyed information concerning health and personal hygiene to the general public. Elsewhere in our columns we quote from one of the last issues figures relating to the supply of medical men in the Dominion of New Zealand which afford an example of the usefulness of this short-lived organ of public health, which it is hoped may be resuscitated at some future date. In the meantime it might be possible for the *New Zealand Medical Journal*, which appears every two months and is circulated among medical men and others, to undertake more general health propaganda in the Dominion.

THE FINAL GEDDES REPORT.

THE third and final instalment of the report of the Committee on National Expenditure, which appeared[1] on Feb. 24th, contains the welcome recommendation that the proposed grant of £130,000 to the Medical Research Council should not be cut down. As regards the smaller grants, the Committee writes: "We are averse from an arbitrary and uniform reduction on a percentage basis on the ground that the saving to the Exchequer would be small compared with the detriment which would be caused to the activities of the learned and scientific world." We have little doubt that public opinion will be found fully to endorse the Economy Committee's judgment in this matter.

THE next social evening at the Royal Society of Medicine will take place on March 8th, when Mr. James Sherren will deliver a short illustrated address on Sailing Ships and the Men Who Sailed Them.

THE death is announced of Dr. Alfred Hill, formerly medical officer of health and city analyst of Birmingham, and professor of chemistry and toxicology at Queen's College. He was 95 years of age and had been living in retirement at Freshwater, I.W.

AMONG the 15 candidates selected by the Council of the Royal Society for election are the names of Dr. C. G. Douglas, Fellow and Lecturer on Natural Science at St. John's College, Oxford, who has done much work on the physiology of respiratory exchange; Captain S. R. Douglas, Director of Bacteriology at the National Institute of Medical Research; and Prof. M. S. Pembrey, Lecturer in Physiology at Guy's Hospital.

[1] H.M. Stat. Office. Cmd. 1589. 4s.

REPORT OF THE RADIUM INSTITUTE, LONDON.

TEN YEARS' EXPERIENCE.

THE annual report of the Radium Institute, London, for the year ending Dec. 31st, 1921, has just been issued and is the subject of comment in a leading article in the present issue of THE LANCET. We reproduce here two sections which are complete in themselves.

Radium Emanation.

The employment of radium emanation as a therapeutic agent is steadily increasing, and its field of usefulness broadens from day to day, as its merits and advantages become more widely recognised. The manipulation of the emanation is a highly technical process, and necessitates the attention and services of a staff of specially trained physicists, whose measurements of its initial radio-activity, and its subsequent variations can be relied upon absolutely. There is further the fact that the emanation can only be obtained from solutions of radium salts; the quantity is limited, and bears a strict ratio to the amount of the parent salt. A gramme of radium bromide in solution will furnish a daily output of radium emanation possessing a radio-activity equivalent to that of 150 mg. of radium bromide. This emanation slowly decays, its initial radio-activity being reduced to one-half in 3·85 days, and to one-fifth in 8·8 days. During the first 24 hours the loss is exactly 16 per cent. (2 per cent. every three hours). This rate of decay never varies, and it is thus a perfectly simple matter to prepare an apparatus the mean activity of which during a period of 24 hours would be exactly equivalent to that of a radium salt apparatus of a stated strength.

As the present market price of radium bromide is about £15,000 a gramme, and at least two grammes are necessary for the production of emanation in sufficient amount to treat even a modest number of patients daily, it is obvious that the handling of radium emanation in a really adequate manner can only be undertaken at hospitals or institutes which are in a position to incur a very large capital charge in acquiring the requisite amount of radium salt; and on this account, unless the price of radium falls very considerably, it appears highly probable that emanation work will for a long time be limited almost exclusively to those institutions which already have a large amount of radium, and a specially trained staff. The Radium Institute is fortunate in possessing both these requirements, and its facilities for radium emanation work, both physical and clinical, are unrivalled in this country.

Radium emanation may be employed for therapeutic purposes in three ways:—

1. *By Inhalation.*—This method obtained a great vogue on the Continent in the years immediately preceding the war. Most of the spas and bathing establishments were provided with radium emanatoria, luxuriously equipped buildings containing rooms the air of which was refreshed from time to time with small quantities of radium emanation and oxygen, or radium emanation only.

The patients undergoing the treatment were immured in these rooms for periods of three, four or more hours daily, during which time they breathed the emanation charged air. This method of treatment made slight headway in the British Isles, and it now appears to be but little favoured on the Continent.

Extravagant claims were made as to its therapeutic value in the treatment of widely differing forms of disease, but these have been only poorly substantiated by subsequent clinical observation, and it is an open question whether the greater proportion of the cures announced were not due as much to the power of suggestion as to the physical effects of the radium emanation.

2. *By Ingestion.*—Radium emanation is dissolved in water, and administered to patients daily for periods of 6, 9, or 12 weeks or longer. The strength of the solution furnished by the Radium Institute is 2 millicuries per litre, and of this, patients take 250 c.cm. during each 24 hours.

The principal conditions benefited by this form of treatment are arthritis deformans, glycosuria, arterio-sclerosis, and the extremely rare malady angio-neurotic œdema.

Not all cases of arthritis deformans are amenable to radium emanation. The patients most favourably influenced are those in whom fibrous, as distinct from osseous changes, are predominant, and the condition infective rather than traumatic in origin. Cases of long standing, with bony ankylosis, osteophytic formation, or ulceration of articular cartilages, derive but little benefit beyond possible relief from pain. Patients suffering from glycosuria or arterio-sclerosis sometimes improve very greatly after a prolonged course of treatment with radium emanation solution, but they should be warned that the improvement will probably be very gradual.

Angio-neurotic œdema responds in a most striking manner. The disease is but seldom met with, but when it does occur is apt to prove very resistant to general medical treatment, and to recur with distressing frequency. In the few cases that have been treated by the drinking of radium emanation solution the result has been most gratifying. The condition has speedily cleared up, and the patients have remained free from their trouble for a very long time, or have been completely rid of it.

3. *By Inclusion.*—In glass or metal tubes and containers, and used for the radiation of diseased tissues in precisely the same fashion as radium salt apparatus.

The idea is prevalent in some quarters that radium emanation apparatus is less effective than radium salt apparatus, but it cannot be too strongly emphasised that their therapeutical properties are identical. In addition, radium emanation possesses certain special advantages. Being a gas it is both compressible and expansile, and these qualities are peculiarly valuable in the making of applicators, it being possible to concentrate the radio-activity very greatly, and to prepare a tube of equal activity to any given radium salt tube, but only one-twentieth of its size. This is of great use in the treatment of small malignant growths or tiny nodules of recurrence, enabling an intensely powerful radiation to be given in a very small area. Conversely, if it is desired to give a weak radiation over a large area a suitable metal emanation container can be made, and charged with the necessary amount of gas to give the precise degree of weak radiation required.

Further, the emanation possesses no intrinsic value, and should an emanation applicators be mislaid or destroyed, the only pecuniary loss incurred is the value of the metal container. This permits radium emanation tubes and applicators to be sent on hire or loan to all parts of the United Kingdom; no security or insurance being demanded, as would be the case if radium salt apparatus were despatched.

Advice is freely given to medical practitioners by the Radium Institute in the treatment of disease with radium emanation apparatus, and if precise information is furnished as to the nature and extent of the disease or growth, a suitable apparatus with full instructions as to technique can usually be forwarded to any address in the British Isles within two or three days.

Prophylactic Irradiation in Cancer of the Uterus.

The use of prophylactic irradiation in cancer of the uterus is steadily increasing, and it appears likely that before long it will be a routine procedure in all operative cases. There are three periods at which prophylactic irradiation may be administered:—

1. Three or four weeks *before* the operation.

This is advisable in all "border-line" cases, as by its use the peri-uterine infiltration is often very definitely diminished, circumscribing its limits, and thus enabling the actual area of infection to be more exactly estimated. The irradiation, at the same time, will serve to bring about the degeneration or inhibit the development of outlying foci of disease in the lymphatics.

2. Two or three days *before* the operation.

This is of peculiar value in treating cases of the proliferative fungating type. The treatment should be administered two or three days before the operation. A tube of not less than 150 mg. activity, screened with 1 mm. of silver, should be introduced into the cervical canal, and an exposure of 24 hours' duration given. The irradiation obtained in this fashion will suffice to exert a lethal effect on any disseminated cells in the immediately surrounding tissues or lymphatics, but there will not be time for the development of a fibrotic change, which would serve to impede the performance of the major operation. As most of the tissues will be removed by the surgical procedure, only small isolated foci of the disease will remain, and these the radiation will probably have effected so powerfully as to produce their ultimate degeneration.

3. Two or three months *after* the major operation.

This should be carried out as a routine measure in all cases where Wertheim's hysterectomy has been performed for malignant disease, but considerable caution must be exercised in its performance. The elaborate and extensive dissection which is associated with Wertheim's hysterectomy appears seriously to impair the functions of the trophic nerves of the pelvis, and some time elapses before these functions return to normal. Too heavy a dose given at too early a date may result in an excessive reaction, with the production of a recto-vesical or recto-vaginal fistula. On this account, therefore, it is advisable to limit the intravaginal treatment very considerably, not to treat the case until at least two months have elapsed, and then to use only a tube of from 50 to 70 mg. activity, screened with 2 mm. of lead, applied in the vagina in contact with the pelvic scar, the exposure to be of 24 hours' duration, preferably two periods of 12 hours each, with an interval of rest of 24 hours between.

A powerful irradiation of the pelvic cavity may, however, be given with perfect safety; 200 to 300 mg. of radium may be used, screened with 2 mm. of lead, and applied externally in such fashion as thoroughly to irradiate the whole operation area. The total exposure in this situation may be of 24 to 30 hours' duration.

WATER-SUPPLY AND THE DROUGHT.

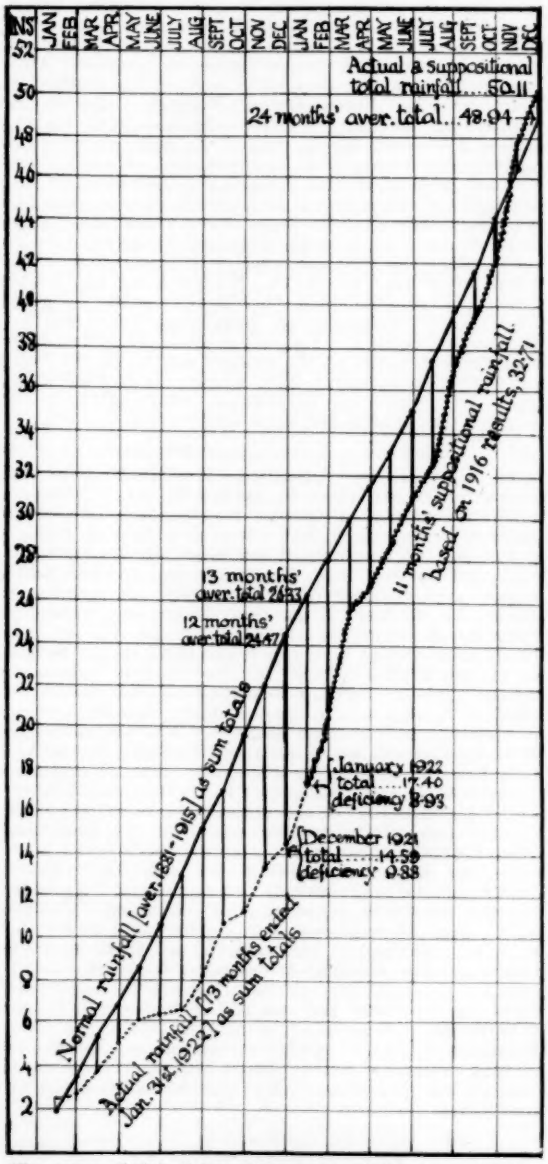
SINCE it was pointed out in January (THE LANCET, Jan. 21st, p. 148) that the adequacy of the public water-supplies remained uncertain, the Ministry of Health has convened a meeting of the following water experts to discuss with the officials of the department the existing shortage of water and the complications likely to result therefrom: Dr. W. A. Bullough, Mr. F. W. Davies, M.I.Mech.E., Dr. W. H. Hill, Sir Alexander Houston, and Mr. Raymond Ross, F.I.C. Dr. Bullough as county M.O.H. for Essex has special knowledge of water shortage; Mr. Davies, engineer and general manager of the Nottingham Corporation Waterworks, represents the British Waterworks Association; Dr. Hill, M.O.H. of the South Oxfordshire Combined Districts, is conversant with rural needs; Sir Alexander Houston has been closely associated with water problems for over 30 years; Mr. Ross, as public analyst for Burnley, has had to deal with moorland and upland sources of water-supply. The results attained were not only of immediate practical value but will also be of great importance if future developments should jeopardise the safety of our water supplies.

The accompanying diagram sets forth the present position of the water-supply of the country and deals with the future in a spirit of hopeful speculation. The upper "plain" line shows the rainfall (sum totals under normal conditions (average 1881–1915). It will be seen that at the end of 12 months the total rainfall amounts to 24·47 in.[1] The line has been extended to cover 24 months, so as to allow of a comparison with the 13 months ended Jan. 31st, 1922 ("dotted" line), and the rest of 1922 in a purely speculative manner ("zig-zag" line). The vertical space between the two lines indicates the surplus, or deficiency, as the case may be.

January, 1921, started with a slight surplus (0·62 in.), from that point onwards the deficiency grew greater and greater, although September did a little to retrieve the situation. By December, 1921, the rainfall, instead of being 24·47 in. amounted to only 14·59 in., a deficiency of 9·88 in. January, 1922, helped matters somewhat, as the rainfall was 2·81 in. (average 1·86 in.), bringing the total for the 13 months to 17·40 in., thus reducing the deficiency to 8·93 in. If we receive only a normal allowance of rain for February and the remaining 10 months of the year, the amount at the end of 1922 would leave the deficiency where it now stands (8·93 in.). This might, and indeed we think would, create a dangerous position.

[1] The Camden Square (London) rainfall records have been chosen throughout unless otherwise stated; but the article deals with the situation generally, and has no special reference to the metropolitan water-supply.

It is true that with many of our surface supplies, the opportunity was taken during January and the beginning of February to replenish our depleted reservoirs with flood water, and the immense volume of water already impounded leaves in these cases no ground perhaps for pessimism as regards the future. The position of our underground sources of supply, however, remains practically unaffected by recent


JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC
Actual & suppositional total rainfall.....50·11
24 months' aver. total..48·94
11 months' suppositional rainfall based on 1916 results 32·71
13 months' aver. total 24·53
12 months' aver. total 24·47
January 1922 total.....17·40 deficiency 3·93
December 1921 total.....14·58 deficiency 0·88
Normal rainfall [aver. 1881-1915] as sum totals
Actual rainfall [13 months ended Jan. 31st 1922] as sum totals

The upper "plain" line shows the rainfall (sum totals) under normal conditions (average 1881-1915) for 24 months. The lower "dotted" line shows the actual rainfall (sum totals) for the 13 months ended Jan. 31st, 1922. The "zig-zag" line shows the suppositional rainfall from February to the end of the present year if a recurrence of the 1916 records occurred. The vertical lines show the surplus, or deficiency, as the case may be.

happenings, and we are fast approaching a period of the year when, from a variety of causes (luxuriant growth of vegetation, high temperature, rapid evaporation, parched ground, &c.), even very heavy rain has great difficulty in reaching our subterranean sources of water-supply. We have already been drawing on these hidden reserves with a prodigality which may have been partially, if not wholly, necessary, but we have really no means of knowing accurately what is now left, or when the balance will be restored.

The Future Supply.

The assumption of a normal rainfall of 22·61 in. for the last 11 months of 1922 may be too conservative an estimate. As recently as 1916, 32·71 in. of rain fell during the last 11 months of that year, which, added to the 17·40 in. belonging to the 13 months ended Jan. 31st, 1922, would reach a total of 50·11 in., or a surplus of 1·17 in. This is shown by the "zig-zag" line in the diagram, and the occurrence of such an excessive rainfall would be no more wonderful than the scarcity which characterised 1921. Even the rainfall of the last 11 months of 1917 (28·74 in.) would reduce the deficiency to 2·8 in., although it must be admitted that in the year in question much of the rain fell during the worst months, from a waterworks point of view.

What is really wanted is a very heavy fall of snow on non-frozen ground and then a gentle thaw. The following are a few instances of late falls of snow: On April 25th, 1908, 17 in. of snow fell at Oxford. A great snowstorm occurred in East Clare on April 1st, 1917. On the night of March 28th–29th, 1919, a heavy fall of snow (the flakes were of a remarkably fine texture) occurred in the South of England. The depth of snow in London on April 27th, 1919, amounted to about 10–12 in. Moreover, we need not altogether despair of the spring and summer months. To take only two examples, serious floods occurred in April, 1908, and in June, 1903. As regards the latter, the rainfall at Oxford, Feilde's Weir (Herts) and Camden Square (London) for the months of March to October, 1903, was as follows: 2·77, 2·13, 4·16, 5·66, 3·17, 3·78, 1·60, and 6·30 in. (Oxford); 2·54, 1·29, 2·61, 5·23, 5·76, 4·11, 3·06, and 5·89 in. (Feilde's Weir); 2·30, 2·14, 2·99, 6·43, 5·20, 4·24, 2·64, and 6·03 in. (Camden Square). A heavy fall of snow, spring or summer floods, and a really wet last quarter of the year would level up the position.

On the other hand, there are those who assert that rainfall is not a mere speculative chance and that if the ultimate conditions which determined the drought of last year persisted during 1922 there would be no reason to expect any material change in the situation. In this connexion an interesting article, "Is the Drought Ended?" in the *Observer* (Sunday, Feb. 12th, 1922) is worthy of study.

PARLIAMENTARY REPRESENTATION OF THE UNIVERSITY OF LONDON.

CANDIDATURE OF SIR SYDNEY RUSSELL-WELLS.

WE have received from the University of London Unionist Association the following statement in view of the possible general election:—

In selecting Sir Sydney Russell-Wells as the prospective Conservative candidate, the University of London Unionist Association was, the Association understands, largely influenced by the widespread feeling among the graduates that, at the present critical time, it is essential for the University to be represented in Parliament by one who has an intimate knowledge of its complicated structure, and the numerous and difficult problems with which the largest University in the British Empire has to deal. There are probably very few who possess as full a knowledge of the working of the University and the needs of its graduates as he does. A London graduate in Science and in Medicine he was elected a member of the Senate in 1903. In 1906 he became Chairman of the Council for External Students and was appointed Vice-Chancellor in December, 1919. A pure London product, he is intensely proud of his University, and is never tired of pointing out how it has been the pioneer in so many great educational movements, such as abolishing all religious tests, throwing its doors open to all classes, being the first to institute degrees in Science, admitting women on terms of real equality to all its degrees as far back as 1878. While anxious that the valuable work of the historic external side of the University should continue unimpaired and unabridged, he has proved himself equally desirous of seeing the University develop in London as a great teaching institution with ample facilities for research and post-graduate

study. His work in connexion with the degrees in Commerce and his success in raising a fund of £318,000 in order to found a great school of commerce in London are known to all graduates. A firm believer in the importance of education to the nation, he has been a sturdy champion of all classes of teachers, and that this is clearly recognised is shown by the fact that the Committee of the Teachers' University Election Association, a body representative of University, Technical, Secondary, and Primary Associations of Teachers, has decided *nem. con.* to give him its full support and to recommend all members of its constituent associations to vote in his favour. While fully recognising the urgent necessity of economy at the present juncture, he is opposed to any reduction of teachers' salaries, or any lessening of existing educational opportunities for pupils of capacity adequate to profit by them. Being actively engaged in practice as a physician, he has a close acquaintance with the needs and aspirations of the medical profession, and can approach health problems with first-hand knowledge rather than from a theoretical standpoint. In politics his views are those of a progressive Conservative, with a firm belief in the advantages of steady evolutionary progress over all extreme and revolutionary methods.

CANDIDATURE OF DR. W. H. RIVERS.

A meeting was held at Essex Hall, London, on Feb. 21st, when Dr. W. H. RIVERS, F.R.S., Fellow of St. John's College, Cambridge, was adopted as the Labour candidate for the Parliamentary representation of the University of London. The Rev. M. L. PERLZWBIG presided.

In presenting Dr. Rivers to the electorate, Mr. SIDNEY WEBB said that with many eminent scientific qualifications and a Fellowship of the Royal Society and a Cambridge College, Dr. Rivers was a distinguished graduate of the University of London and belonged to one of its important constituent colleges, the medical school of St. Bartholomew's Hospital. It was the business of Universities to send to Parliament men of intellectual distinction and not mere politicians: men who would bring to the sordid business of politics something which comes from original hard work and knowledge of the facts of the world, and not merely of the facts of newspaper articles. Dr. Rivers's candidature should appeal to all classes of graduates in the constituency, of which medical men formed the largest group, and particularly to educationists. The Labour Party was the only party that had offered determined resistance to any reduction in educational expenditure, while insisting on an increase of such expenditure in the interests of economy.

Mr. ROBERT JONES, D.Sc., seconded the proposal, which was supported by Miss MARION PHILLIPS, D.Sc., Major A. G. CHURCH, and others.

In reply to questions from delegates of various societies and associations, Dr. RIVERS said that one thing which he had learned from the study of psychology was the enormous importance of education, especially in secondary and primary schools. With regard to prohibition and the use of alcohol, Dr. Rivers said he was extremely interested in the problem, and what was really needed was more knowledge, both physiological and psychological. It would be interesting to watch the reaction of the people in America to the experiment that was being tried there. Local option had an extremely important effect in educating the people to understand the evils of the liquor traffic.

Sir ARTHUR NEWSHOLME said that he supported Dr. Rivers as a man whose views were to the fore in regard to psychology and who was an advanced and original anthropologist. It would be an honour to the University if he were elected, while, quite apart from the scientific aspect, he could vote for him conscientiously on political grounds.

The proposal having been carried that he should be adopted as the Labour candidate for the constituency, Dr. RIVERS briefly replied, referring to a rumour that there was some doubt of his being a graduate of the University of London. He did not know, he said, whence this rumour emanated, but not only was he a graduate but he had worked in the University of London until the age of 29. He expressed his hearty adherence to the Labour programme, explaining that scientific men were accustomed to think about reasons for what they did and thought, and therefore it was fitting that a scientific man should belong to a party that had a programme, and the Labour Party seemed to be the only one that could satisfy the scientific man in that direction.

ROUMANIA.

(FROM OUR OWN CORRESPONDENT.)

New Method of Preservation of Dead Bodies.

Dr. Béla Lükö, lecturer at the University of Bucharest, at present chief surgeon at the County Hospital in Szatmar, has worked for some years, in conjunction with Prof. Jellyesnicki, teacher of anatomy at the University of Budapest, on a method for the permanent conservation of corpses. After successful experiments he lectured on his method in 1909 at the International Medical Congress at Budapest. At that time he refrained from making public his work, for he wished to wait at least ten years to see the results of his invention. He embalmed several bodies at the Anatomical Institute of the Budapest University, all of which have been found in a perfect state after the lapse of ten years; they have been exposed to changes of air and temperature with no result. The method consists of injection into the veins of a kind of serum, invented by Dr. Lükö, which is pressed into the blood-vessels by great atmospheric pressure, so that even the smallest capillaries are filled. The serum prevents putrefaction and decomposition of the tissues, and keeps the body in perfect condition. The bodies so treated give, after 12 years, the appearance of being those of persons who died a few days ago.

Workmen's Insurance in Roumania.

Of late years the Workmen's Welfare Ministry has given much attention to extending the workmen's insurance against sickness. Roumania is largely an agricultural country, but there are over a million industrial and commercial workers. In Transylvania there are large mines, foundries, and lumber mills, where over 300,000 factory workers are employed. Here the former Hungarian insurance system is maintained, while in Bessarabia and in the old kingdom a system very much like that of the French is in operation. Now all the larger insurance centres are to become branches of the Bucharest Central Workmen's Insurance Office, and the system of operation will become uniform. The centralisation of insurance will put a stop to the autonomy of the branches; however, they will work independently and control their own budgets. In every county committees consisting of workmen and employers will control the administrative work of the insurance office; the medical work is controlled by the chief insurance inspector residing at Bucharest. Every industrial or commercial worker and domestic servant has to be registered for insurance. The fee to be paid by workmen varies between 1 and 3 per cent. of the wages. For this the workmen and his family get free medical attendance, drugs, and maintenance in incapacity. If the illness lasts longer than three months, then the case has to be brought before a committee of medical men and workmen. The Workmen's Insurance Office controls several health resorts, mineral baths, sanatoriums, convalescent homes, &c. When necessary, patients are entitled to travel free.

The Influenza Epidemic in Roumania, Bulgaria, and Yugoslavia.

Since the beginning of this year influenza has been epidemic in the whole of the Middle East of Europe. This time it did not come from the south, as in the autumn of 1919, but from the west. In Hungary the epidemic presented itself early in December, 1921, and still persists. In the Balkan countries the cases are generally very mild, lasting only three or four days. It begins not with the usual coryza, but with a feeling of general fatigue, bronchitis, and pain in the limbs. The onset of depression and fatigue is sudden. The accompanying fever ranges from 37·8°–39·5° C. Luckily all cases end with complete recovery; complications, even pneumonia, are very rare. No fatal cases have been reported. The epidemic of 1919

brought about many ear complications: this time they are very scarce. The morbidity-rate is very high.

Painless Labour in Hypnotic State.

Dr. Louis Hartmann, director of a large county hospital, encouraged by the good results reported in the medical journals on painless labour during hypnotic sleep, has tried this method in the obstetrical wards of his hospital. He selected for the purpose one tertipara, two quartiparæ, and one quintipara, and induced hypnotic sleep after the bursting of the sac. Delivery proceeded smoothly in all four cases, the patients obeying promptly when ordered to press; the process was shortened a great deal by having contractions at the doctor's will. After delivery the mothers awoke in good general condition, only one of them complaining of stupor; this state soon ceased, however. The loss of blood was in all cases small. Dr. Hartmann proposes now to select primiparæ.

Proposed Medical Act.

At the end of January a congress of medical men was held at the house of the Medical Society of Bucharest. The proceedings were chiefly of a business nature, and resolutions were passed in favour of the following reforms: (1) All sanitary institutions to be placed under the control of one central administration; (2) an organisation to be formed for the improvement of sanitary and hygienic conditions in the country districts; (3) the State to fix a minimum salary for medical men in State employment; (4) free medical advice to be abolished; and (5) the Medical Society to appoint a commission which will compile and elaborate a Medical Act to regulate the qualifications of practitioners, and to distinguish qualified from unqualified practitioners of medicine and surgery.

Feb. 5th.

CZECHO-SLOVAKIA.

(FROM OUR OWN CORRESPONDENT.)

A State Radium Institute.

A STATE radium institute is shortly to be opened at Prague. Czecho-Slovakia is one of the richest sources of radium, which has been forthcoming at Jáchymov, in Northern Bohemia, since 1910. Under the Austrian régime a hospital and watering-place were established there for radium therapy, but as Jáchymov is a small place, with poor railway connexions, it has been decided to establish an institute in Prague where ambulatory treatment can also be given to patients who could not afford to pay big prices for living in a watering-place like Jáchymov. A pavilion has been selected in the Vinohrady Hospital in the outskirts of Prague, which will be transformed into a State Institute of Radiology. The selection has been well made; the same hospital will later serve as a research hospital in connexion with the State Institute of Hygiene, to be built on adjoining land early in the spring. The institute will be the second on the continent with reference to the quantity of radium available and will be the third in the world in this respect. It will have 3·2 gr. of radium in hand, and this quantity is to be increased in proportion as the output of the Jáchymov mines develops. Dr. Ferdinand Tománek, who has spent a year in America studying radium therapy at Boston and Rochester, will be in charge of the institute.

The Dispensary System.

The question of free treatment in health centres and dispensaries is being discussed very earnestly. Through the work of the Ministry of Health and Physical Education and of the Masaryk Antituberculosis League this question has become acute. The Ministry of Health is establishing health centres in every county town, and the Masaryk League is erecting dispensaries for tuberculosis all over the country. While these institutions are primarily for preventive work, it is very difficult to draw a sharp line between strictly preventive and strictly curative work. In the dispensaries of the Masaryk League, especially, curative rather than preventive work prevails. This is largely due to an incorrect conception on the part of physicians in charge of the dispensaries as to the proper function of a tuberculosis dispensary, where the chief activity at present is to give specific tuberculin treatment, other work being frequently neglected. Another complication is the fact that 95 per cent. of the population are under compulsory sickness insurance, and the insurance physicians naturally protest if their patients are treated elsewhere free of charge. Attempts have been made to give dispensary physicians a contract with the insurance associations, as their specialists for tuberculosis; these have been opposed by members of the profession who wish to introduce free choice of physicians into the insurance system. These questions occupied a conference recently called by the Committee on Social Medicine of the Medical Association. A resolution was passed that the health centres now being erected are primarily for preventive care, but should be made accessible to every member of the community, that the medical profession has no reason or right to interfere with their activities, and that other activities more important than injecting tuberculin should be emphasised. It was realised that prevention and cure were not easily distinguishable in child welfare centres and dispensaries for treatment of venereal diseases, and that the physician should have discretion as to the giving of free treatment.

Feb. 16th.

ROYAL MEDICAL BENEVOLENT FUND.

AT the meeting of the committee held on Feb. 14th 30 cases were considered and £314 voted to 27 applicants. The following is a summary of some of the cases relieved:—

Daughter, aged 76, of M.R.C.S. Eng. who practised in Kent and died in 1855. Applicant's sole income is derived from investments which bring in £21 per annum. Up to quite recently she was taken care of by her own sister, aged 74, but owing to helplessness has to have a nurse, who is provided by friends. Voted £18 in 12 instalments.

Daughter, aged 74, of M.R.C.S. Eng. who practised in Kent and died in 1855. Applicant and her sister were educated by relations as their parents died when they were quite young. They have been governesses in Russia and lost everything. Applicant has only £30 from investments and receives small help from friends. Voted £18 in 12 instalments.

Daughter, aged 62, of M.R.C.S. Eng. who practised in Cornwall and died in 1873. Applicant and her sister are in receipt of a grant from the Fund of £18 in 12 instalments, but as they find it very hard to secure boarders and applicant is suffering from rheumatism a separate grant is asked for and the case is strongly recommended for the Committee's favourable consideration. The total amount they received last year from boarders was £19 10*s.* and help from friends. Their rates amount to £13 and the house is their own. Voted £18 in 12 instalments.

Widow, aged 34, of M.B., B.S. Lond. who practised in Buckinghamshire and died in 1921. Applicant and two children left totally unprovided for, and when late husband's estate is realised it is only expected that there will be enough to pay the creditors. She has received £20 from the Officers' Families Fund and £20 from friends. At present staying with father. Voted £15 in three instalments.

Widow, aged 44, of M.R.C.S. Eng. who practised at Tutbury and died in 1921. Applicant left with five children, and husband's estate is not yet settled up, and up to the present the creditors have only received 15*s.* in the £. Applicant's share of the estate amounts to a share of the furniture only. Mother has only a home to offer, as she is entirely dependent on her married sons. Voted £15 in three instalments.

Widow, aged 59, of M.R.C.S., L.R.C.P. Lond. who practised at Newbury and died in 1903. Applicant had a home for Indian children, but failed during the war. She received £7 7*s.* for looking after a small boy during the holidays and £15 from investments. She has received hospitality at various times. Now lives with married daughter. Vote £18 in 12 instalments.

Subscriptions may be sent to the Honorary Treasurer, Sir Charters J. Symonds, K.B.E., C.B., F.R.C.S., at 11, Chandos-street, Cavendish-square, London, W. 1.

LITERARY INTELLIGENCE.—The Oxford University Press announce the forthcoming publication of "The Population Problem," by A. M. Carr-Saunders.

Correspondence.

"Audi alteram partem."

IMMUNISATION AGAINST DIPHTHERIA.

To the Editor of THE LANCET.

SIR,—Much has been done with the object of controlling the epidemicity of diphtheria, but efforts at prevention have been more or less disappointing. Now, however, a ray of hope comes in a possible future immunisation of the population against this disease by the use of a mixture of toxin and antitoxin. This hope, if realisable, is not likely to come about in the early future, for many difficulties lie in its way. Therefore, while doing everything to help the furtherance of immunity production, one must also be even more zealous in the endeavour to treat the sufferer from diphtheria as early in the disease as possible; for, of course, every case of diphtheria can be cured if treated adequately and sufficiently early.

In a letter published in THE LANCET of May 21st last year I drew attention to the fact of so many patients arriving at my hospital after the disease was well advanced, and without previous antitoxin treatment. It is very rare for patients to have had antitoxin administered before admission to the hospital, and still more rarely has an adequate dose been given. Therefore, while the practitioner often suspects diphtheria and sends a swab to the bacteriologist, he very rarely administers antitoxin, and still more rarely does he give an adequate dose. It is unpleasant to me to make a statement like this, for the practitioner may find it difficult to get antitoxin, or to get it in adequate amount. Even so, the facts remain.

I think the two predominating causes of late admission to hospital are delay on the part of the relatives of the sufferer to call in a physician, and the physician deferring his diagnosis until a bacteriological examination has been made. In my letter I protested strongly against deferring treatment for bacteriological examination; indeed, it is quite inexcusable in cases that are at all severe. It is therefore with thankfulness that I find Sir Frederick Andrewes,[1] in his address to the Society of Medical Officers of Health on Feb. 17th, advocating the same point of view. Broadly speaking, diphtheria must be recognised from its clinical appearances, and even failing actual diagnosis, suspected diphtheria must be regarded as that disease unless one is sufficiently experienced to say the case will certainly recover if treatment is postponed. All things considered, it must be admitted that the death-rate from diphtheria is much too high and is not at all creditable to our profession. I think much could be done to correct this; obviously the medical press could help materially in educating medical opinion. May I thank you, Sir, for what you have already done? The education of the public is necessary, and though I know of meritorious individual efforts, much more is necessary if this object is to be attained.

Surely in a matter of such public importance the right measures to adopt should be considered by a committee of bacteriologists, public health administrators, experienced clinicians, and general practitioners.

I am, Sir, yours faithfully,

FREDERIC THOMSON.

North-Eastern Hospital, St. Ann's-road, S. Tottenham, Feb. 20th, 1922.

THE WOOD-HILL FUND.

To the Editor of THE LANCET.

SIR,—The following is the sixth list of subscriptions to the Wood-Hill Fund. In the original letter, which you published in THE LANCET on Dec. 3rd, 1921, appealing for contributions in aid of Dr. Wood-Hill, it was stated that the total expenses incurred by him, including the damages awarded, would be about £1600. I have recently heard from the solicitor for the defence and I regret to say that the original provisional estimate of £1600, made immediately after the trial, will be considerably exceeded, owing mainly to the large claim for costs sent in on behalf of the plaintiff. Dr. Wood-Hill's total liability will be not less than £2250.

I am, Sir, yours faithfully,

HAMILTON A. BALLANCE,
Hon. Treasurer.

All Saints Green, Norwich, Feb. 25th, 1922.

Sixth List of Subscriptions.

Amount previously acknowledged £938 8*s.* 6*d.*

Fife Branch of British Medical Association (per Dr. D. Elliot Dickson, Hon. Sec.)	20	14	4
Hastings Division of British Medical Association (per Mr. C. Charnock Smith, Hon. Sec.)	11	0	0
Hon. Staff of Bradford Royal Infirmary (per Mr. F. W. Goyder, Hon. Sec); Ipswich Clinical Society (per Mr. Cecil S. Staddon, M.C., Hon. Sec.); Medical Staff of Golden-square Throat Hospital (per Mr. Lionel Colledge) each	10	10	0
Stourbridge Medical Society (per Mr. George J. Dudley, O.B.E., Hon. Sec.)	10	0	0
Colwyn Bay Medical Society (per Dr. S. L. Butterworth Wilks)	8	8	0
Coventry Division of British Medical Association (per Dr. N. J. L. Rollason, Hon. Sec.) 10*s.* 6*d.* from each of following members: Drs. B. A. Ballantyne, J. Bradley, W. D. Coghill, F. A. Collington, J. T. H. Croft, D. Davidson, S. C. Harris, A. Hawley, W. H. Lowman, N. J. L. Rollason, H. D. Rollinson, and H. P. Thomason	6	6	0
Drs. Relton, Powell, Hoskyn, Wheeler, and Roche, Rugby; Dr. George Stewart, Ipswich; Drs. H. and W. A. Watson, Norwich; Sir Joseph O. Skevington, K.C.V.O., Windsor each	5	5	0
Major Sidney L. Barrett, Beccles	5	0	0
Mr. Hugh Davies, London	3	3	0
Mr. G. F. Briggs, Hull; Dr. A. Ingram Cooke, Chobham; Dr. L. B. Perry, Baghdad; Mr. J. Sleeman Reed, Gorleston-on-Sea each	2	2	0
Dr. George Schilling, Kessingland; Mr. V. J. Duigan, East Dereham; Dr. C. Ede, Colne; Dr. Norman C. Carver, Surbiton; Dr. A. W. Havard, Lowestoft; Dr. Geoffrey Cowan, Thetford each	1	1	0
Dr. S. O. Eades, Ipswich; Mr. L. P. Costobadie, Mottram each	0	10	6

A DIPLOMA IN TUBERCULOSIS.

To the Editor of THE LANCET.

SIR,—There is much to be said for the trend of your remarks in THE LANCET of Feb. 25th (p. 390) on the proposal to institute a diploma in tuberculosis. The comment is opportune in view of the step taken by the Welsh School and, no less, of the present consideration by the General Medical Council of the conditions and curriculum for the Diploma in Public Health. If, as is probable, the result of that consideration be the inclusion in the curriculum for the D.P.H. of training in the special subjects of tuberculosis, venereal diseases, child welfare, &c., advantage will certainly accrue. It is desirable that all officers attached to the health service of the country should have practical acquaintance with those developing spheres of work.

From men who intend to devote themselves especially to tuberculosis, which is now a recognised division of the health service, more may well be required—and what applies to tuberculosis is no less applicable to the other specialised departments. In the interests of those who have in view advancement to higher posts in those departments, it seems reasonable that some official credential should be available in respect of higher study and proficiency in the given subject. This might readily be afforded by attachment to the general Diploma in Public Health of an additional certificate to the effect that such special proficiency had been attained. The extra statement would be a matter for the examining body before which the candidate appeared. The practical result would be that while some candidates remained content with the possession of a general Diploma in Public Health, others would prefer to have the diploma with honours, pointing to special proficiency in one or other department. The proposal obviates what most of us feel to be undesirable—namely, the multiplication of special diplomas in limited departments of medicine.

[1] THE LANCET, Feb. 25th, p. 373.

The University of Edinburgh has not only taken the significant step of making attendance on a course of tuberculosis compulsory in the ordinary medical curriculum, but has included, within the course of study for its recently established Diploma of Public Health, further instruction in tuberculosis, venereal diseases, and child welfare.—I am, Sir, yours faithfully,

Edinburgh, Feb. 25th, 1922. R. W. PHILIP.

ALPINE TREATMENT OF TUBERCULOSIS.

To the Editor of THE LANCET.

SIR,—Any delay in replying to Sir Douglas Powell's letter is explained by my desire to obtain exact data on points he has raised, and the opinions of other eminent medical men who have visited Davos and Montana. The support of Dr. Leonard Hill in the *Times* of my views on the clinical value of the treatment of tuberculosis at Montana is obviously of the first importance. His recommendation that the great towns of the North of England should combine to have their own sanatorium there, is one which must carry great weight. I had not heard of the serious investigation which he has been making into the effect of the cold, dry, still air and sunshine of Montana, in early cases of phthisis and tuberculosis. I shall read with much interest, as coming from the Director of the Department of Applied Physiology of the National Institute of Health, the report which Dr. Hill is preparing, with the assistance of Dr. Bernard Hudson, dealing with this subject.

In reply to the criticisms which my fellow-enthusiast for Alpine heights, Sir Douglas Powell, passes upon my letter in the columns of the *Times* of Feb. 10th, I would observe that I did not say that the Canton Grisons was "concerned in the decision" to sell the Queen Alexandra Sanatorium; I referred to the cantons of Thurgau and Schaffhausen. This sale is, I understand, only subject to a referendum which is now being carried out. The decision of the committee almost to give away this splendid property was strongly deplored by the eminent physicians who visited Davos and Montana last summer, and Sir William Willcox coöperated with Dr. Mitchell Bruce (a member of the committee), Mr. Maxse, British Consul-General at Zurich, and Mr. Lockett, our Consul at Davos, to see if this disastrous sale could be averted. Energetic action was taken, and the property could have been saved for British patients if the committee had not already committed themselves to the sale.

Sir Douglas Powell objects to the implication of my statement that "the English fled from Davos and Arosa before the invasion of German lung cases during the war," and says that "Davos and Arosa are alike resorted to by English visitors." I have made careful inquiries since Sir Douglas Powell's letter appeared as to the number of English, German, and other visitors at Davos and Montana. The following is the result of my inquiry. For the week ending Feb. 10th, 1922:—

Davos.		*Montana.*	
Swiss (mainly German Swiss)	1600	British	232
British	353		
Germans	363	Genevan-Swiss at the Genevan Sanatorium and Belgians at the Belgian Home and others	296
Other nationalities: Austrian, Dutch, Greek, Italian, French, Spanish, &c.	1383		
Total	3699	Total	528

On the principal issue as to the value of the Alps in general and Montana in particular, in the treatment of tuberculosis, a number of distinguished consultant physicians on the staff of our leading hospitals who visited Davos and Montana last summer have furnished the following authoritative answer to Sir Douglas Powell. In harmony with what I understand to be professional etiquette, I do not publish the names, although I have received the signed copies without any restriction.

"We, the undersigned, Fellows of the Royal College of Physicians, who visited Montana-sur-Sierre last summer, travelling through Switzerland as the guests of the Swiss Government, desire to express our concurrence with the following statement of the medical press after the visit:—

The Lancet.—The undoubted climatic advantages of the Alps, the well-equipped sanatoriums, and the therapeutic renown of the mountains are of inestimable service.

Brit. Med. Jour.—Montana, being open towards the south, east and west, but protected from the north winds, has attained in recent years a leading position.

Brit. Jour. of Tuberculosis.—Among health stations Montana undoubtedly occupies the first place. . . . At all times of the year it is milder, drier, and enjoys more sunshine than other health stations in Switzerland.

We are of opinion that there are definite and very considerable advantages all the year in treatment at this exceedingly dry and sunny centre, which, unfortunately, cannot be obtained within the British Isles."

After such a declaration of high medical opinion would it not be a breach of trust to divert funds, obtained by the patronage and support of the Queen Mother for the treatment of English middle-class patients in Switzerland, in order to enlarge a similar institution in the damp and trying climate of the British Isles?—I am, Sir, yours faithfully,

MARTIN CONWAY.

House of Commons, Feb. 23rd, 1922.

To the Editor of THE LANCET.

SIR,—Dr. Felix Savy has done well to call attention to the exaggerated views held in some quarters as to the curative value of Alpine climate in pulmonary tuberculosis. May I add, from my own experience, another case to that given by Dr. Savy in your last issue. A young solicitor suffering from consumption was advised to go to Davos after he had been a few weeks in an English sanatorium. He went, but got worse after an attack of hæmoptysis, and had to return home and finish his treatment in a private sanatorium. He recovered and is quite well to-day. The truth is we have yet to know what an ideal climate is in the treatment of pulmonary tuberculosis. The study of the death-rate in the light of climatographs in America (Interpretation of the Death-rate by Climatographs, *Modern Medicine*, May, 1919, p. 13) has shown that cold waves of weather (not continuance of low temperature) or an alteration of temperature from hot to cold, or the reverse, appear to be much more favourable to health than a uniform climate, even though the latter has an almost ideal temperature. This may perhaps be one of the reasons why the cure or arrest effected in England, with its uncertain and variable climate, is more satisfactory than where the climatic conditions appear to be ideal. Again, our experience, together with that of other English sanatoria, goes to show that successful results are much better in winter with its damp, fogs, and lack of sunshine than in summer, though it has brighter weather and a larger amount of sunshine. Also, in Finland, as I pointed out in my recent book, the average winter sunshine is two hours, and yet the sanatoria there get better results during the eight months of cold weather than in the four hot months when they have sunshine all the time, and many recoveries from phthisis take place in such smoke and dust-laden districts as Sheffield in England and Pittsburgh in America. Evidently patients get well in a variety of climates, and many factors play their part in the arrest of pulmonary tuberculosis besides sunshine and other ideal climatic conditions.

I am, Sir, yours faithfully,

Mendip Hills Sanatorium, Feb. 25th, 1922. C. MUTHU.

THYROID GLAND TOLERANCE.

To the Editor of THE LANCET.

SIR,—Of recent years several writers have insisted that the doses of thyroid gland, which were at one time commonly employed, are much too large. This is certainly true in many cases, and some persons, whose thyroid secretion one might nevertheless suspect to be deficient, are very susceptible to quite small doses. On the other hand, I am convinced that some of us have been misled by the earnest advocates of minute

doses, with the result that thyroid medication has been abandoned as useless in certain cases because the quantity given was quite inadequate. Patients who require large doses do not necessarily present the classical appearance and all the symptoms of myxœdema, although signs of hypothyroidism are present in some degree. The tolerance of every case must be determined individually by observing the weight, pulse-rate, temperature, and subjective symptoms; unless this is done, there is as much likelihood of under- as of over-dosage.

As examples of high thyroid tolerance I may refer to two cases. One is a lady with Raynaud's disease and the peripheral form of scleroderma involving the hands, feet, and lower parts of the forearms and legs. The urine contained a large quantity of indican, and X ray examination of the alimentary tract showed a distended dropped cæcum, in which there was considerable stasis. No other source of toxæmia was discovered. An abnormal strain of *B. coli* was isolated from the fæces, which was agglutinated by the patient's serum in a dilution of 1/200. Subcutaneous fat was in excess in the abdominal wall and on the thighs and legs, the temperature was subnormal, and the pulse-rate rather slow. Small doses of thyroid had been given over considerable periods without apparent benefit. She is now taking 20 gr. of thyroid gland (Burroughs and Wellcome's "tabloids" and Armour's tablets have been employed) per diem; it was not until 17 gr. a day were being given that the temperature reached the normal line. There is very great improvement in her general health, the Raynaud symptoms are much less evident, and the skin of the sclerodermatous areas is becoming soft again. The pulse-rate remains between 70 and 80.

The other case, a Dutch girl, came to me for almost complete alopecia of the scalp of several years' duration. She is mentally very alert, but signs of hypothyroidism are present. For several weeks she took 10 gr. of thyroid gland (i.e., two of B. W. and Co.'s 5 gr. tabloids) per diem without any untoward symptoms, but is now having 7 gr. As a result of this treatment her weight has been reduced from 11 to 10 stone, her pulse-rate has risen from 65 to 72, and hair is now growing freely over the whole scalp. On 7 gr. per diem her weight and pulse-rate remain constant.

The tolerance of the first case must, I think, be quite exceptional. One point, often apparently overlooked by enthusiastic ductless-gland therapists, is that in giving thyroid to those who during early life or middle-age have developed hypothyroidism, we are treating a secondary symptom and not a primary cause. We are still very ignorant of the possible factors involved in the development of thyroid insufficiency.—I am, Sir, yours faithfully,

H. W. BARBER.

Devonshire-place, W., Feb. 25th, 1922.

THE ERLANGEN METHOD OF X RAY TREATMENT.

To the Editor of THE LANCET.

SIR,—In this treatment, in which attempts are made to give a lethal dose to the cancer cell, it appears that sufficient attention has not been paid to our knowledge of the varying susceptibility of malignant tumours. Clinical experience shows that this must be great. From the experimental standpoint, H. C. Wood, for instance (*Journal of Cancer Research*, April, 1921, p. 177), has shown that for carcinoma this may vary from two to eight erythema doses. It must therefore be misleading to speak of a destructive carcinoma dose as being 90–110 per cent. Even tumours of similar microscopic appearances vary widely in susceptibility.

In the comparison of X rays with radium in the treatment of deep-seated tumours Dr. R. Morton, in his paper in the last issue of THE LANCET, did not draw attention to a very great advantage that radium has over X rays when it is buried among the tumour cells, for in this way all the cells of a tumour can be given a lethal dose with a minimal exposure of the surrounding healthy tissue. It is true that in the immediate neighbourhood of the radium the cancer cells will receive more than the lethal dose, and sufficient perhaps to produce a sloughing of the centre of the tumour. But this disadvantage is not to be compared with the disadvantage of, or even danger from, the profound constitutional changes, anæmia, &c., which follow X ray treatment by the Erlangen methods, and which are due to the very large doses which the normal tissues of the patient receive.

I am, Sir, yours faithfully,

J. C. MOTTRAM.

The Radium Institute, Feb. 28th, 1922.

The Services.

ROYAL ARMY MEDICAL CORPS.

Maj.-Gen. Sir G. D. Bourke, ret. pay, is appointed Col. Comdt., vice Surg.-Gen. (ranking as Maj.-Gen.) Sir F. W. Trevor, ret. pay.

Lt.-Col. E. W. W. Cochrane retires on ret. pay and is granted the rank of Col.

Maj. R. J. Cahill relinquishes the temp. rank of Lt.-Col.

Capt. E. F. W. Mackenzie relinquishes the temp. rank of Maj. on ceasing to be spec. empld.

Temp. Capt. E. C. Lindsey relinquishes his commn. and retains the rank of Capt.

MILITIA.

The undermentioned relinquish their commns.: Lt.-Col. J. Clerke (retains the rank of Lt.-Col.); Maj. R. J. Stirling (retains the rank of Maj.).

Capt. K. B. MacGlashan to be Maj.

INDIAN MEDICAL SERVICE.

Col. Bhola Nauth is appointed Hon. Physician to the King, vice Maj.-Gen. P. Carr-White (ret.).

The undermentioned are appointed Hon. Surgeons to the King: Col. J. K. Close, vice Hon. Col. Sir W. R. Hooper (deed); and Col. W. G. Pridmore, vice Surg.-Maj.-Gen. P. S. Turnbull (decd.).

Obituary.

CHARLES WRAY, F.R.C.S. ENG.

Mr. Charles Wray, who died in a London nursing home on Feb. 13th at the age of 63, was ophthalmic surgeon to the Croydon General Hospital, infirmary, and council school. A Yorkshireman by birth, he received his medical education at the London Hospital, qualifying M.R.C.S. in 1881; his work was purely ophthalmic, and his early appointments were at the Royal London Ophthalmic Hospital, the Royal Eye Hospital, and the Western Ophthalmic Hospital. He became F.R.C.S. in 1886, and in 1887 was responsible for the opening of the first special department at the Croydon General Hospital, where he continued to work almost to the end of his life. So highly valued were his services that upon the completion of his regulation 25 years' tenure of the post of ophthalmic surgeon the hospital committee took the exceptional step of requesting him to retain his position, which he consented to do. A colleague writes:—

"He was a most charming man to work with, ever ready to help in any difficult question of diagnosis or treatment and to give the benefit of his mature judgment and ripe experience. He was a skilful operator . . . . a man of most generous disposition and great originality, who retained an unbounded enthusiasm for his work until the last."

Wray's consideration for his patients, together with his unusual power of organisation, explained the popularity of his department and the large number of attendances with which he was able to deal. He was a frequent contributor to our columns and to the ophthalmological journals, his contributions covering a wide area of knowledge, although his special and particular interests were conical cornea and bony tumours of the orbit. For many years he was a leading member of the Croydon Medical Society. He is survived by his widow.

Medical News.

UNIVERSITY OF OXFORD.—At a Congregation held on Feb. 18th the degree of Doctor of Medicine was conferred on E. W. M. H. Phillips, Jesus College.

UNIVERSITY OF LONDON: THE CHAIR OF BACTERIOLOGY.—At a meeting of the Senate held on Feb. 22nd Prof. H. R. Dean, M.A., M.D., B.Ch. Oxf., F.R.C.P., was appointed as from June 1st next to the University Chair of Bacteriology tenable at University College Hospital Medical School. Prof. Dean holds a fine record: Salters' Company Research Scholar in Pharmacology in 1906, and Radcliffe Travelling Fellow of Oxford from 1909 to 1911; he has been Resident Assistant Physician at St. Thomas's Hospital, Assistant Bacteriologist at the Lister Institute of Preventive Medicine, Professor of Pathology in the University of Sheffield, and since 1915 Professor of Pathology and Pathological Anatomy in the University of Manchester. At the Royal College of Physicians of London he has been Horace Dobell Lecturer, and much of his writing on pathological and bacteriological subjects must be familiar to readers of THE LANCET.

UNIVERSITY OF LEEDS.—Prof. Sir Berkeley Moynihan has given to the University of Leeds an endowment for the annual award at the Leeds Medical School of a gold medal to the best student of the year in medicine and surgery, to be known, in accordance with Sir Berkeley Moynihan's wish, as the William Hey Medal in Medicine and Surgery, in commemoration of the work of that great Leeds surgeon. It will be recalled that William Hey (1736–1819), who established the tradition of surgical skill which has ever since been one of the chief distinctions of Leeds, took an active part in the foundation of the Leeds Infirmary, of which he was senior surgeon from 1773 to 1812; his statue by Chantrey now stands in the entrance hall of the infirmary. His son William (1772–1844), and his grandson, the third William Hey (1796–1875), were also eminent surgeons, the latter being one of the founders of the Leeds School of Medicine in 1831. The medical traditions of the family were carried into the fourth generation by two great-grandsons of the first William Hey—viz., Samuel Hey and Edward Atkinson, surgeons at the Leeds Infirmary from 1850–1872 and from 1874–1894 respectively.

OXFORD OPHTHALMOLOGICAL CONGRESS. — This Congress will assemble at Keble College, Oxford, on the evening of July 5th, and the meeting will be held on July 6th and 7th. On the 6th, a discussion on the Significance of Retinal Hæmorrhages will take place, to be opened by Dr. C. O. Hawthorne and Mr. P. H. Adams. The Doyne Memorial lecture will be delivered on the morning of the 7th by Mr. J. Burdon-Cooper, the subject being the Ætiology of Cataract. The official dinner of the Congress will take place on the evening of the 6th at Keble College. Members intending to take part in the discussion or to make communications are requested to send in their names to the honorary secretary, Dr. Bernard Cridland, Salisbury House, Wolverhampton.

ROYAL SANITARY INSTITUTE.—On Tuesday, March 14th, at 5.30 P.M., a sessional meeting will be held at 90, Buckingham Palace-road, London, S.W. 1. Sir Henry Tanner will take the chair, and a discussion will be opened by Mr. A. H. Barker, B.Sc., on Central Heating in Relation to Domestic and Other Buildings. On Friday and Saturday, March 17th and 18th, a sessional meeting will be held at 6 P.M. in the Public Hall, Blackburn, when Prof. H. R. Kenwood (chairman of the Council of the Institute) will take the chair. There will be a discussion on the Sanitation of Places of Entertainment, opened by Dr. W. Allen Daley, medical officer of health for Blackburn, and another on the Conversion of Pail Closets, opened by Mr. A. T. Gooseman, borough engineer, Blackburn.

ROYAL SOCIETY OF MEDICINE.—At a special general meeting of the Society, held recently, a new by-law was unanimously passed empowering the Council to elect medical men and women (whether British or otherwise) who within five years of their first professional qualification apply for election, to be non-corporate Associates of the Society. They will enjoy their privileges from year to year and the Council may at any time terminate the connexion. They will pay an annual subscription of 3 guineas but no admission fee, will not receive the "Proceedings" gratis, or vote or hold office or take part in the management. Associateship shall terminate automatically on Sept. 30th following the expiration of five years after the date of the Associate's first professional qualification, and, if election to the Fellowship follows, the Associate, who has paid three annual subscriptions, will not be required to pay an admission fee.

THE LATE DR. BRYAN HOLME ALLEN.—Dr. B. H. Allen died at his residence at Bexhill on Feb. 21st. He received his medical education at University College, London, and qualified M.R.C.S. in 1865, becoming M.D. Lond. in 1870. For many years he had a large practice in Hastings and moved to Bexhill on his retirement.

TYPHUS CONFERENCE AT JOHANNESBURG. — A conference of medical officers of health of Johannesburg, Pretoria, and Germiston, and leading Transvaal practitioners, has been held at Johannesburg to discuss the occurrence of typhus fever on the Rand. It was resolved to appoint a committee to go fully into the subject of preventive measures. A further conference will be held.

ROYAL INSTITUTION OF GREAT BRITAIN. — The Friday evening discourse on March 10th will be delivered by Prof. T. R. Merton, F.R.S., at 9 P.M. The subject is Problems in the Variability of Spectra. On March 7th, at 3 P.M., Sir Arthur Keith, F.R.S., will give a third lecture on Racial Problems in Asia and Australasia. On March 9th Prof. H. M. Lefroy will give a second lecture on the Balance of Life in Relation to Insect Pest Control; and on March 11th Sir Ernest Rutherford, F.R.S., will give a second lecture on Radio-activity.

HYGIENE PUBLICITY CAMPAIGN IN INDIA.—With a view to familiarising the people with a knowledge of how to protect themselves against epidemic diseases, the United Provinces Government has started a hygiene publicity campaign. The Assistant Director of Public Health is in charge, and a number of specially trained sub-assistant surgeons have been provided with travelling dispensaries from which they will deliver popular lectures, give lantern-demonstrations, and distribute pamphlets on epidemic diseases. A large portion of both the recurring and non-recurring charges will be borne by the district boards.

THE LATE DR. CHARLES DRAGE.—Dr. Charles Drage, who died recently at the advanced age of 97, received his medical education at St. Bartholomew's Hospital, becoming M.R.C.S. and L.S.A. in 1848, and taking his degree of M.D. at King's College, Aberdeen, in 1857. After practising for a short while at Ipswich he settled at Hatfield, where he worked until his retirement in 1912. One of his early patients was the first Duke of Wellington, and he became medical attendant to three Prime Ministers in turn—Lords Melbourne, Palmerston, and Salisbury. A practitioner of great skill and sound judgment, Dr. Drage had a profound contempt for charlatanry within or outside the medical profession, and found much to criticise in court physicians of the middle of the last century.

HIGHBURY HOSPITAL, BIRMINGHAM.—On Feb. 20th Mr. Ian Macpherson, the Minister of Pensions, opened a new block of buildings which has been added to this hospital for disabled ex-Service men. The Highbury estate was purchased with a fund which had been raised in Birmingham through the influence of two Lord Mayors, Sir James Brooks and Mr. Neville Chamberlain. Another large residence was presented by Mr. and Mrs. Barrow Cadbury, and a third residence was purchased as a home for cases requiring long treatment. By 1919 the citizens of Birmingham had provided the Ministry of Pensions, free of all cost and rent free, with three hospitals of 310 beds for the treatment of pensioners. Since they were opened 2957 cases have been treated. The recent extension to Highbury comprises four wards, two operating theatres, electrical, massage, gymnastic, plaster, and other special departments. Towards this extension the Treasury made a grant of £25,000, which was supplemented by £10,000 from the Joint Committee of the Red Cross and the Order of St. John and £5000 from the Lord Mayor's Fund.

L.C.C. AND MEDICAL SALARIES.—At the last meeting of the London County Council Mr. Samuel March created something of a surprise by congratulating the medical profession on the success with which they had boycotted the Council's recent attempt to obtain assistant medical officers at mental hospitals at a salary of £200 a year, "without emoluments." In addition to his membership of the L.C.C., Mr. March is mayor of Poplar, and one of the group of councillors who recently went to prison in consequence of Poplar's refusal to collect the rates levied by the L.C.C. The Asylums Committee of the Council, reporting on the "£200-a-year" offer, stated that the invitation "did not attract candidates"; an effort is now to be made by the Council to fill the position at a rate not exceeding £400 a year, "on present economic conditions," without emoluments. Mr. March complimented the profession on their solidarity, and hoped they were strongly enough organised to insist that if a woman were appointed she should receive equal pay for equal work. It was gratifying, he said, to know that the highly skilled professions were able to unite their forces, and he hoped it would be a lesson to the less skilled workers whom he represented.

FEE FOR NOTIFICATION OF INFECTIOUS DISEASE.—An Order in Council was issued on August 10th, 1921, fixing the following August 31st as the date of the termination of the war, and consequently the fee payable to medical practitioners for the notification of cases of infectious disease occurring in their private practice reverted to 2*s.* 6*d.* on Sept. 1st last, while the fee for the notification of cases occurring in institutions remains at 1*s.* The position in regard to the payment for the notification of cases of infectious disease appears not to have been clearly understood by some local authorities, and a circular (No. 285) has been issued by the Ministry to the clerk of each local authority in England and Wales setting out the position categorically under date Feb. 24th.

HEALTH GRANTS IN IRELAND.—During the disputes between the British Government and the local authorities in Ireland in 1920, the Government decided to withhold the central grants ordinarily paid for the health services and certain other activities. The decision was opposed by the medical profession, which held that whatever political disputes might arise, there should be no unnecessary interference with the care of the sick. This view was put to the Chief Secretary by the Irish Public Health Council, his statutory advisers on matters of health, but he could not accept the Council's advice, on the plea that the grants had been withheld because local authorities refused to permit the customary audit. The Chief Secretary declined, further, to promise that if an audit were allowed the grants would be paid. In making the announcement to the House of Commons last week that the grants withheld up to the present would now be paid, Mr. Winston Churchill, on the other hand, declared the withholding of the grants to be a "weak measure."

METROPOLITAN ASYLUMS BOARD.—A course of lectures and demonstrations in hospital administration for the Diploma in Public Health will be given at the North-Western Hospital, Lawn-road, Hampstead, N.W. 3, by Dr. E. W. Goodall, medical superintendent. The course will extend over three months, and the lectures will be delivered on Mondays and Thursdays at 5.15 P.M., beginning Monday, April 3rd. The fee for the course is £3 3*s.*; medical men who take the course are required before attending at the hospital to pay the fee to the Clerk to the Metropolitan Asylums Board, Embankment, E.C. 4.—A students' course of instruction in the diagnosis and treatment of fevers will be held in May at the following hospitals: the Eastern Hospital, Homerton, E. 9; the North-Eastern Hospital, Tottenham, N. 15; the North-Western Hospital, Hampstead, N.W. 3; the Western Hospital, Fulham, S.W. 6; the South-Western Hospital, Stockwell, S.W. 9; the Grove Hospital, Tooting Graveney, S.W. 17; the Park Hospital, Lewisham, S.E. 13; the Brook Hospital, Woolwich, S.E. 18. A two months' course will also be given in August and September at the South-Eastern Hospital, S.E. 11, by Dr. F. M. Turner, Medical Superintendent.

CENTRAL COUNCIL FOR DISTRICT NURSING IN LONDON.—The annual report of the council and of the executive committee for the year 1921 was presented to a meeting held at the Metropolitan Asylums Board on Feb. 23rd. In response to a memorandum adopted by the council at their last meeting the majority of the District Nursing Associations expressed their willingness to provide for attendance on patients desirous of employing visiting nurses at a small fee. The Paddington District Nursing Association appointed an extra nurse in order to enable them to undertake the nursing of patients able to pay for the services rendered. Suggestions were made as to the possibility of establishing separate organisations of nurses for the purpose, but the demand does not appear as yet to have proved sufficient to induce any considerable number of nurses to take up this class of work. Miss Isabel Richardson, late matron of the London Temperance Hospital, has been appointed secretary-visitor, part-time, with an honorarium of £100 a year. The nursing of insured persons has been the subject of much consideration and discussion during the year, and various nursing associations have made arrangements with approved societies to supply nurses for insured persons at a rate of 1*s.* per visit. A questionnaire has been drawn up, which will be sent to associations receiving grants from the council, in order to ascertain their financial position and whether they are being conducted efficiently and economically. The panel of emergency nurses has been maintained. In response to a resolution passed at the Central Council meeting last year the General Nursing Council have expressed a hope that in the future much less theoretical instruction than is required at present will be necessary for nurses taking up district work. The sum of £7415 was distributed from various grants received.

FOLLOWING on the outbreak of bacterial food infection, which occurred last September in a south Lancashire town, the local Grocers' Association in a neighbouring town is stated to be offering to insure its members up to a maximum of £500 against claims arising out of a possible repetition of the incident.

THE LATE DR. GEORGE WRIGHT HUTCHISON.—The late Dr. G. W. Hutchison died on Feb. 24th at his residence in Clive Vale, Hastings. Dr. Hutchison, who was in his seventy-fifth year, graduated M.B., C.M. Aberd. (honours) in 1869, becoming M.D. in 1872 and M.R.C.P. Edin. in 1878. He took up practice at Chipping Norton, Oxfordshire, and was for long a leading figure in the public life of the town, of which he was mayor in 1892–93. He was an occasional contributor to THE LANCET and other medical journals.

RONTGEN SOCIETY.—A general meeting will be held on March 7th, at 8.15 P.M., in the Institution of Electrical Engineers, Savoy-place, Victoria Embankment, London, W.C. A paper on Comparisons between the Therapeutic, Photographic, and Ionisation Effects of Ultra-Violet and of Beta Radiation will be read by Mr. L. H. Clark, B.Sc., and Mr. B. D. Watters, B.Sc., and will be followed by a paper on Apparatus for Deep X Ray Therapy by Mr. E. E. Burnside, A.M.I.E.E. The fifth Silvanus Thompson Memorial Lecture will be delivered by Sir Oliver J. Lodge, F.R.S., at a special meeting of the Society to be held at the Institution of Electrical Engineers on Tuesday, March 21st.

MIDWIFERY TRAINING IN INDIA.—Referring to the recent decision of the General Medical Council, the *Pioneer* of Allahabad says that as the representations of the Secretary of State have proved successful, it hopes that the medical colleges will now show their appreciation of the grace given them by improving their facilities for midwifery training at the earliest possible moment. There is a tendency to regard the attendance of medical practitioners at childbirth as a peculiarity of Western custom, but, if Indian medical students desire to be registered in the United Kingdom, it is obvious that they must conform to the requirements of that registration. While there may ne some difficulty in certain provinces in providing the necessary maternity practice, these should not prove insuperable, as the example of Madras has shown.

MENTAL AFTER CARE ASSOCIATION.—The annual meeting of this Association was held at the Apothecaries' Hall, London, under the presidency of Dr. W. F. R. Burgess, Master of the Company, on Feb. 24th, when the report and balance-sheet for the year ending Dec. 31st, 1921, were unanimously adopted. The report, which was submitted by Dr. H. Rayner, chairman of the Association, stated that the position as regards the extension and usefulness of the Association was most satisfactory, but monetary support was inadequate, and to meet current expenses capital to the extent of £583 had had to be realised. During 1921 applications on behalf of 874 persons were received. The object of the Association was to restart in life patients who were convalescent or had recently recovered from mental illness.—Sir Claud Schuster said that no one whose duty lay in the care of the insane could help being greatly impressed by the intense sympathy and interest shown by those who administered asylums. In any great system of administration there must be of necessity instances of neglect and hardship, but the fact remained that the lunatic received the greatest care from the time he entered an asylum until his discharge. Last year 7206 persons were discharged from asylums as wholly recovered and 3276 as partially recovered; the Mental After Care Association had enabled many of those patients to resume their normal life.—General Sir John Goodwin (Director, A.M.S.) referred to the help given by the Association to soldiers and sailors discharged from mental hospitals.—Mr. C. Gabain also spoke in support of the Association, and Mr. Charles Marriott said he had received a letter from Sir Maurice Craig, who had succeeded the late Sir George Savage as treasurer, offering to give £200 to the Association on the condition of a further sum of £100 being raised in donations of £5 each. On the motion of Sir Faudel Phillips, seconded by Dr. C. H. Bond, the honorary officers were re-elected.—Sir James Crichton-Browne, proposing a vote of thanks to the Apothecaries' Company for the use of their Hall, said we were suffering from one of the periodical lunacy scares which were promoted sometimes by well-meaning people, and often by others who did not understand the problems connected with the subject. The number of re-admissions to asylums might be large; that was the fault not of medical treatment, but rather of conditions in the outside world. Much was said about psycho-analysis; what, however, was really required was psycho-synthesis—sympathy and intelligent appreciation of the mind shattered by disease.

Parliamentary Intelligence.

HOUSE OF LORDS.

WEDNESDAY, FEB. 22ND.

Clinical Thermometers Bill.

Lord STANMORE, Lord-in-Waiting, moved the second reading of a Bill to regulate the sale of clinical thermometers by providing that they must be tested, approved, and marked in accordance with the regulations made by the Board of Trade before they could be supplied or delivered. The provision, he said, had already been in operation under the Defence of the Realm Regulations and its value had been universally recognised by the medical profession. The Bill was read a second time.

Coroners Bill.

The Coroners (Emergency Provisions Continuance) Bill was read a third time and passed on the motion of the Earl of ONSLOW, Parliamentary Secretary to the Ministry of Health.

THURSDAY, FEB. 23RD.

The Russian Famine.

The ARCHBISHOP OF CANTERBURY called attention to the reported facts respecting the gravity of the famine in Russia and asked whether H.M. Government was now able to make any statement. He said they had set before them—and he referred specially to Sir Benjamin Robertson's report—a fairly clear objective as to what could be done with a definite plan for doing it more or less worked out with the prospect of a real possibility of practical business-like relief giving and a definite estimate based on knowledge and experience as to the sum of money that was required for doing it. All that seemed to him to put the situation in a different light from that in which it had been before and there was upon them a somewhat increased responsibility. He wished to know whether H.M. Government could see their way to adopt any practical steps in leadership, or whether they had any suggestion to make of a substantial grant to supplement voluntary aid and so help them to do what they felt could be done. Everyone of their lordships felt as strongly as he did what their obligations were in these matters—obligations for the sake of this unhappy people and their obligation for the sake of the health of Europe, for famine bred pestilence which went far beyond the famine area.

Lord EMMOTT said that as chairman of the Russian Famine Relief Fund responsible for the proper disposal of the stores given by the Government to the British Red Cross, and then handed by them to his organisation, he did not want to take too much the attitude of looking a gift horse in the mouth, but there were some facts that he thought he ought to make known to their lordships. A good many of these stores were useless from the point of view of famine relief. They received £30,000 worth of foodstuffs. They had to collect them at terrible expense from army dumps and pay all the freight charges to send them out to Russia. Among those stores were 200 tons of lime-juice valued at £2100; and lime-juice after all could not bring great physical relief or moral comfort to people who were dying from starvation. Pork and beans and tinned beef were less useful than grain, but still they had their value from the point of view of feeding adults. With regard to the balance of what was said by the Disposals Board to be worth £100,000, they collected £21,000 worth of stores in Egypt, and brought them to Constantinople, and they consisted of moth-eaten clothing and second-hand things with some medical comforts. They found that it was really so little use sending them to Russia that they arranged to divert them for the purpose of the refugees in the Constantinople district, with the consent of H.M. Government. These stores, which were said to be worth £21,000, were valued by Lloyds at £8500. The remainder, £11,000 worth according to the Disposals Board valuation, were handed over to them and consisted of medical drugs, hospital equipment, and so on. He was credibly informed that many of the drugs were what was known as "time expired." They had been handed over only on the previous day after two and a half months delay. There were some 300 tons, and he supposed it would cost at least £1000 to send them to Russia, and they had had two or three of the staff waiting to receive them for two or three months. One felt that from the point of view of famine relief something more digestible was required than operating tables, of which there were a good many in this medical equipment. He must say quite frankly that £10,000 or £50,000 in cash would have been infinitely more useful than this nominal gift of £100,000 worth of goods.

Marquess CURZON, replying for the Government, said Lord Emmott had spoken as chairman of the Russian Relief Fund, and if he was dissatisfied with the nature of the material with which he had to deal, he could assure him that no one was dissatisfied with the way in which the Fund, and particularly Lord Emmott himself, had devoted themselves to their task. As to the question of the stores it always seemed that in our country the administration of charity was accompanied and disfigured by stupidity of the grossest description. So it had been in this case. He imagined that it was the Disposals Board which had been responsible for the errors which were complained of and he promised to put himself into communication with those persons with a view of seeing whether any more serviceable stores were available. As to the question of Government assistance, the Chancellor of the Exchequer had pointed out to him that if he went to the House of Commons for a sum of money he could not get it. He (Lord Curzon) could only say that, glad to help as he was, he had not persuaded his colleagues to help. He suggested that those who were bringing this matter forward should organise public opinion and if necessary get two or three hundred Members of the House of Commons to sign a round-robin to the Government to consider the matter.

HOUSE OF COMMONS.

WEDNESDAY, FEB. 22ND.

Leprosy.

Colonel Sir CHARLES YATE asked the Minister of Health how many cases of leprosy there were in this country and what steps were being taken to segregate persons suffering from this disease and to provide for their treatment and maintenance; whether the disease was notifiable or not; and what success had attended remedial treatment.—Sir A. MOND replied: In regard to the first part of my hon. friend's question I have no definite information as to the number of cases of leprosy in this country as the disease is not notifiable. The number is, however, very small and the cases which have been reported to the Ministry have without exception been contracted abroad. I am advised that as the infectivity of the disease in this country is very restricted measures for the compulsory segregation of persons suffering therefrom would not be justified. Up to the present no specific cure for leprosy has been discovered, but the matter is being studied by workers in various countries.

Cost of Lunatics in County Asylums.

Mr. HURD asked the Minister of Health what reply he was making to representations from ratepayers' associations and meetings, as, for instance, from the Frome division, protesting against the inadequacy of the Government payment of 4*s.* per head weekly for the maintenance of inmates in county asylums, seeing the great increase in the cost of maintenance and the unfair burden thus thrown upon the rates.—Sir A. MOND replied: The amount of this grant was based on the estimated difference between the cost of maintenance in workhouses and in asylums respectively, and while it is true that the cost of maintenance in an asylum has increased since the grant was fixed it is equally true that the cost of maintenance in a workhouse has also increased. It has been repeatedly stated in replies to questions put in this House that no revision of the grant can be undertaken at the present time.

Local Authorities and Milk Substitutes.

Mr. HURD asked the Minister of Health whether it was the experience of his department that fresh milk formed the principal part of the diet in the successful treatment of tuberculosis; and whether he would advise all local health authorities that they should use no substitutes for fresh milk in this or any other part of their administration.—Sir A. MOND replied: The answer is in the negative. I am advised that although milk may be an essential element of special diets for tuberculous persons in certain stages of the disease, or for young children, a mixed general diet is preferable in the case of adults to one consisting mainly of milk. As regards the second part of the question, I am advised that certain substitutes, such as full cream dried milk, suitably prepared for use, are as nutritious as fresh milk so long as vitamins are provided in the necessary amounts in other parts of the diet.

Sanatorium Treatment.

Mr. JOHN DAVISON asked the Minister of Health the number of applications made during the past 12 months for sanatorium treatment; the number of people admitted to receive such treatment; the average waiting time between application for treatment and the treatment itself; and whether tuberculosis was on the increase.—Sir A. MOND replied: The returns made to my department by the local authorities who are responsible for making arrangements for the treatment of tuberculosis do not provide the precise information asked for in the first three parts of the question, but I am sending the hon. Member particulars of the numbers of persons receiving and awaiting treatment, respectively, in residential institutions from local authorities in England

on the first day of each month from June 1st last. As regards the last part of the question, I am sending the hon. Member particulars of the annual notification of, and deaths from, tuberculosis, which indicate that the answer is in the negative.

Leprosy in India.

Colonel Sir CHARLES YATE asked the Secretary for India if he could give any information as to the results of the amended Leper Act passed by the Imperial Legislative Council in India; how far the Act had been put into force by the various provincial governments; how many lepers had now been segregated; and how far the remedial treatment of the disease gave promise of success.—Mr. MONTAGU replied: I have not received any information, but will inquire.

Wound Pension Statistics.

Sir FREDERICK HALL asked the Minister of Pensions what was the number of men in receipt of wound pensions at Dec. 31st, 1921, on account of having lost one or more limbs or one or both eyes; what was the total annual amount of their pensions; and if he would state what were the corresponding figures at Dec. 31st, 1920.—Major H. BARNSTON replied: The number of men thus disabled by wounds sustained during the Great War and in receipt of pensions from the Ministry on Dec. 31st, 1921, was some 37,250; and the number on Dec. 31st, 1920, was approximately the same. My right hon. friend regrets that he is not in a position to give the annual amount of these pensions without a laborious review of the individual papers.

Taxation of Motor-cars.

Lieut.-Colonel MOORE-BRABAZON asked the Parliamentary Secretary to the Ministry of Transport whether it was intended to introduce legislation to reduce taxation on the horse-power basis of cars built in 1915 instead of 1914, and continue such rebate on all cars that became seven years old.—Mr. A. NEAL replied: The answer is in the negative. The ground for the rebate in the case of pre-1913 engines is not the age of the engine but the type of construction.

THURSDAY, FEB. 23RD.

Dr. Lomax and Asylum Administration.

Mr. ROBERT RICHARDSON asked the Minister of Health whether, in view of the letter, dated Jan. 20th, sent to his department by the National Asylum Workers' Union to the effect that the union had advised its members not to submit evidence before the Committee on Asylum Administration because representatives of the Medico-Psychological Association predominated on the committee, and that the charges made in Dr. Lomax's book were, in the main, charges against the administrative methods and capacity of members of that Association, he could give the grounds for his statement that the union had refused to submit evidence because it was refused representation on the committee.—Sir A. MOND replied: The first communication from the union was a verbal request through a member of the executive council for representation on the committee. It was only when I was unable to accede to this request that the union refused to give evidence and sought to justify refusal on the grounds indicated in the question.

Economies in Health Ministry.

Mr. GEORGE TERRELL asked the Minister of Health what steps he had decided to take up to the present to give effect in his department to the recommendations of the Geddes Report.—Sir ALFRED MOND replied: I am anticipating that I shall be able to obtain the entire saving suggested on my estimates for 1922–23 as recommended by the Geddes Committee mainly on the proposals submitted by me.

The Shepherd's Bush Orthopædic Hospital.

Lieut.-Colonel SPENDER CLAY asked the Minister of Pensions whether his attention had been called to the hardship which the contemplated removal of the Shepherd's Bush Hospital to other quarters would entail on out-patients attending the hospital; what action he proposed to take to assist such cases; and whether the saving which it was anticipated would be the result of the change would be almost entirely wiped out by the cost of removal and allowances to out-patients.—Mr. MACPHERSON replied: In selecting alternative accommodation for out-patient treatment full regard is being paid to the convenience of the pensioners, and I do not anticipate any difficulty in making satisfactory arrangements. The estimated cost of the removal from Shepherd's Bush, which I gave my hon. and gallant friend last Thursday, includes the cost of providing suitable out-patient accommodation.—Major COHEN asked if the right hon. gentleman was aware of the remarkable efficiency of the electrical appliances at this hospital, and if it was intended to scrap those appliances or remove them.—Mr. MACPHERSON: All the appliances will be removed.—Viscount CURZON asked if it was a fact, as stated in the press, that the treatment of out-patients could not proceed so satisfactorily as at present if the hospital was removed.—Mr. MACPHERSON: My medical officers tell me that it can.—Sir H. FOREMAN: In view of the strong feeling which exists with reference to this hospital would the right hon. gentleman be prepared to reconsider the matter if he received a more moderate demand from the guardians?—Mr. MACPHERSON: Yes, Sir. The desire of the Ministry has always been to retain this hospital, and even now I am prepared to consider a modified proposal from the guardians. But it must be at once. I cannot keep the fate of all these men hanging in the balance.—Viscount CURZON: Is it the action taken by the guardians which necessitates the removal of this hospital?—Mr. MACPHERSON: Yes, without doubt. It is a question of rent. I pressed them very hard and I have been negotiating for a long time. I know the value of this hospital and I am very anxious to keep it, but I refuse to be blackmailed. They are asking a rent which I think is wholly unjustified.

The Rockefeller School of Hygiene.

Captain ELLIOT asked the Minister of Health whether he could give any information as to a donation by the Rockefeller Foundation towards the establishment of a School of Hygiene in London.—Sir A. MOND replied: Yes, Sir. I am happy to be able to announce that the Rockefeller Foundation have informed me of their readiness to provide a sum not exceeding 2,000,000 dollars towards the cost of providing and equipping such a school of hygiene on the understanding that the British Government accept the responsibility for finding the cost of staffing and maintaining it, estimated certainly not to exceed £25,000 per annum at the outset. I do not anticipate any actual charge on the votes for, say, two years. I may explain that the foundation of such a school was recommended by the Committee on Post-Graduate Medical Education in London appointed by my predecessor early last year. I presided over an expert committee which went further into the question, and finally, in view of the financial difficulty at present of carrying out this recommendation, valuable and timely as it is, I thought it well to put the whole case to the Rockefeller Foundation as one which they might think it well to support in the interests alike of the British Empire and the United States of America, and, indeed, from the widest standpoint of world progress in public health. In the result they have made the generous offer which I have announced, and I have been authorised, as Minister of Health, to accept that offer and am now engaged in the preliminary steps towards the establishment of the school. The House will no doubt agree with me in heartily welcoming this evidence of common interest and coöperation between ourselves and the United States of America in furthering education and research in preventive medicine.

Function of Pensions Appeal Tribunals.

Mr. NEIL MACLEAN asked the Minister of Pensions what was the function of a pensions appeal tribunal or a medical appeal board; whether it was their duty to decide whether the disability was attributed to or aggravated by military service; and whether they had any powers to assess the amount of pension or percentage of disability.—Mr. MACPHERSON replied: The function of pensions appeal tribunals established under Section 8 of the War Pensions (Administrative Provisions) Act, 1919, is to hear and determine appeals against decisions of the Ministry refusing entitlement to pension. In the case of final awards made under Section 4 of the War Pensions Act, 1921, pensions appeal tribunals, modified in constitution for that purpose, hear and decide appeals based on dissatisfaction and have power to vary the amount of the award. I have no control over these bodies, which are established on an independent statutory basis under the jurisdiction of the Lord Chancellor. Medical appeal boards, on the other hand, are Ministry institutions under my control, their duties being to deal with appeals based on dissatisfaction with the assessment of disablement by a previous Ministry Survey Board where entitlement has already been admitted and the award is not final.

Pay of Temporary Medical Officers.

Mr. GODFREY LOCKER-LAMPSON asked the Minister of Pensions whether he was considering the reduction in pay of the temporary medical staff, which worked out at £972 per head, in accordance with the recommendation of the Geddes Committee.—Mr. MACPHERSON replied: Yes, Sir.

MONDAY, FEB. 27TH.

Ministry of Health Vote.

On a supplementary vote of £10 for the Ministry of Health, Sir ALFRED MOND (Minister of Health) said there was a saving of £1,350,000 on National Health Insurance. That was partly due to the sickness benefit claims being less than was anticipated and partly to savings effected by the reduction of the remuneration of the medical men which resulted from the last negotiations and came into force as from Jan. 1st of this year. The saving for this financial year under that heading was £250,000. There was an additional sum required of £514,000 under the sub-head of tuberculosis. This sum was required because they had under-estimated in respect of the original estimate. For the year 1920–21 they had

under-estimated the amount required for grants to the extent of £200,000; for 1921–22 to the extent of £250,000; and there was an increase required of £65,000 for capital expenditure. The tuberculosis grants were larger than anticipated owing to the increased cost of the maintenance of hospitals and the cost of keeping patients. Next year it was intended to stereotype the grant paid the year before, and in that way he hoped to avoid under-estimating. Under the heading of maternity and child welfare there was an increased sum required of £23,000. This was due to increased expenditure by local authorities in connexion with the supply of milk to necessitous mothers during the coal strike and the present serious period of unemployment.

Mr. MYERS, in moving the reduction of the vote by £5, said he did not complain of the additional expenditure upon the treatment of tuberculosis. He viewed with considerable regret the suggestion made in another quarter that some reduction should take place in that expenditure. As a matter of fact that expenditure was altogether inadequate at the present time. But he thought that a large amount of the money spent under this head was wasted, and that they did not get the results they ought to get. In addition to making provision for further beds, in sanatoria for civilians and ex-Service patients they needed a national scheme of after-care treatment. Until they got such a scheme they would not get the full benefit from the expenditure on the treatment of tuberculosis.

Dr. ADDISON said he agreed that they did not get the best out of their expenditure on tuberculosis treatment, nor did he think they ever would do so until the present system was supplemented by a more considerate after-care system of treatment and observation. It was bad policy to spend large additional sums on the treatment of tuberculosis on the one hand and on the other to cease to improve the homes in which the people lived.

Lieut.-Colonel FREMANTLE, as one who had served as a county medical officer for some time, agreed that to deal with tuberculosis on a large scale they must aim at improvement of housing.

The motion to reduce the vote was negatived by 169 votes to 58, and the vote was carried by 140 votes to 58.

Medical Inspection of Claybury Asylum.

Mr. FREDERICK ROBERTS asked the Minister of Pensions whether he was aware that the first and last occasion on which a medical representative of his department visited ex-Service men in Claybury Asylum was on Dec. 14th, 1920; and whether in view of the number of ex-Service men who had been sent to this institution he could explain the reason for this lack of attention. Major TRYON replied: I would remind my hon. friend that certified patients in asylums are under the care of the Board of Control. Arrangements were, however, made over a year ago under which a medical officer attached to Ministry headquarters visits, by the courtesy of the Commissioners of the Board of Control, those asylums in which ex-Service men are treated at the cost of the Ministry. Claybury Asylum was last visited by a Ministry inspector on the date mentioned and will shortly be again visited in the ordinary course of re-inspection which has now been commenced. A full twelve months is required to go round all the asylums, but should the circumstances of any case brought to notice so require a special visit is paid.

Ex-Service Men and Neurasthenia Treatment.

Mr. FREDERICK ROBERTS asked the Minister of Pensions how many hospitals had been set up for the special treatment of ex-Service men suffering from nerve and mental troubles; in what districts were such hospitals situated; and what was the total number of patients for which accommodation could be found.—Major TRYON replied: Eighteen hospitals for the treatment of neurasthenia in its various forms have been established under the direct control of the Ministry in different parts of the country, providing accommodation for about 170 officers and 2500 other ranks. I am sending my hon. friend a list of these institutions, but I may mention that treatment for the milder forms of neurasthenia is also provided in hospitals not specially set apart for that purpose. Treatment for certified mental cases is provided by the Board of Control.

Medical Examinations for the Civil Service.

Rear-Admiral SUETER asked the Secretary to the Treasury how many non-Service men rejected for the Army on medical grounds had been passed as medically fit for the Civil Service on passing the recent examination, and the number of ex-Service men rejected as medically unfit on passing the clerical examination.—Mr. HILTON YOUNG replied: Of the candidates who passed the examination for appointment to the clerical class in 1920, 37 non-Service men who were medically rejected for military service have been accepted as physically fit for the Civil Service; 16 ex-Service men have been rejected on physical grounds for appointment to the Civil Service.

TUESDAY, FEB. 28TH.

Ex-Service Men and Tuberculosis.

Sir JOHN BUTCHER asked the Minister of Pensions whether his attention had been called to the serious position of ex-Service men suffering from tuberculosis owing to war service, and to the fact that a very large proportion of these men who had died of tuberculosis between January, 1915, and December, 1921, had died under 40 years of age; and whether, when the men so suffering had, after a definite period of observation by the Ministry, been diagnosed as suffering from pulmonary tuberculosis, he would award them permanent pensions of not less than 70 per cent. or 80 per cent. disability.—Major TRYON replied that the suggestion could not be accepted. He added: Generally speaking, in every active case of tuberculosis the man receives the equivalent of pension at the maximum rate; and where a pensioner has satisfactorily completed a prescribed course of treatment and training pension at the 100 per cent. rate is granted for six months, followed by at least 50 per cent. for the next two years.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Monday, March 6th.

TROPICAL DISEASES AND PARASITOLOGY: at 8 P.M.

Paper:

Dr. Castellani, Dr. Douglas, and Dr. Thomson: Tonsilomycosis.

Papers:

Prof. Leiper, Dr. M. Khalil, and Mrs. Philpot: Hookworm in Cornwall.

Cinema Film: Hookworm Control.

Tuesday, March 7th.

ORTHOPÆDICS: at 5 P.M.

Discussion on the Use of Remedial Exercises as applied to Scoliosis.

Amongst others, the following will take part in the discussion: Mr. McCrae Aitken, Mr. E. B. Clayton, Dr. Barrie Lambert, Mr. Paul Bernard Roth, Dr. Timberg, and Dr. Carl Westman.

Fellows of the Society and members of other Sections who are interested in "physical treatment" are cordially invited to be present and to take part in the discussion.

PATHOLOGY: at 8.30 P.M. at University College Hospital, Gower-street, W.C. 1.

Communications, &c.:

Dr. W. S. Lazarus-Barlow: Further Attempts at the Experimental Production of Carcinoma by Means of Radium.

Dr. D. Embleton and Dr. F. H. Teale: Intestinal Infection.

Dr. C. Dukes: Absorption of Ferments by Bacteria.

Dr. J. W. McNee: Some Specimens of Influenzal Pulmonary Infection.

Dr. A. E. Boycott and Dr. C. Price-Jones: Restoratives of Blood-volume after Hæmorrhage and Anæsthesia.

Wednesday, March 8th.

Social Evening.

Fellows and their friends will be received by the President and Lady Bland-Sutton at 8.30 P.M. Mr. James Sherren will deliver a short address at 9 P.M. on Sailing Ships and the Men who Sailed Them (illustrated).

The Library will be open, and various objects of interest will be exhibited. Music, light refreshments, and smoking.

In order to make arrangements for the evening the main Library will be closed from 5 P.M., but readers can be accommodated in the other reading rooms.

N.B.—All Fellows and their friends are cordially invited. No tickets are required.

Will Fellows who know of Dominion and Foreign Practitioners who are visiting this country send their names and addresses to the Secretary in order that invitations to attend the Social Evening may be sent to them.

Thursday, March 9th.

NEUROLOGY: at 8 P.M.

Discussion on Decerebrate Rigidity and Spasticity, to be opened by Dr. F. M. R. Walshe and Dr. G. Riddoch.

Friday, March 10th.

CLINICAL: at 5.30 P.M. (Cases at 5 P.M.)

Exhibition of Cases:

Dr. Cross (introduced by Mr. Rowlands) will show a case of Winged Scapula.

Other cases will be shown.

Short Paper:

Prof. H. Maclean and Dr. Isaac Jones: Some Observations on Production of Lactic Acid in Stomach Diseases.

OPHTHALMOLOGY at 8.30 P.M. (Cases at 8 P.M.)

Papers:

Mr. P. G. Doyne: Coloured Vision.

Mr. R. Affleck Greeves: A series of Sympathising Eyes examined microscopically.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS OF LONDON, Pall Mall East.
THURSDAY, March 9th.—5 P.M., First Milroy Lecture: Dr. Major Greenwood: The Influence of Industrial Employment on General Health.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.
MONDAY, March 6th.—5 P.M., Dr. Scott Pinchin: Pulmonary Neoplasm.
TUESDAY.—5 P.M., Dr. G. Pernet: Points in the Diagnosis of Syphilitic and Non-syphilitic Rashes.
WEDNESDAY.—5 P.M., Mr. Donald Armour: Practical Surgery.
THURSDAY.—5 P.M., Sir W. Hale-White: Hæmatemesis. (Open to all Medical Practitioners.)
FRIDAY.—5 P.M., Dr. Owen: Management of the Premature and Delicate Infant at Birth.
Daily:—10 A.M., Visit of Post-Graduates to Wards. 2 P.M., In-patient and Out-patient Clinics and Operations.

NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC POST-GRADUATE COURSES, Queen-square.
MONDAY, March 6th.—12 noon, Dr. Greenfield: Syphilis of the Nervous System. 2 P.M., Dr. Hinds Howell: Out-patient Clinic. 3.30 P.M., Dr. Aldren Turner: Demonstration of Cases.
TUESDAY.—2 P.M., Dr. Grainger Stewart: Out-patient Clinic. 3.30 P.M., Mr. Armour: Surgical Treatment of Tumours of the Spinal Cord.
THURSDAY.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Dr. Hinds Howell: Hysteria.
FRIDAY.—2 P.M., Dr. Gordon Holmes: Out-patient Clinic. 3.30 P.M., Dr. Adie: Intracranial Tumours (2).

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION.
WEDNESDAY, March 8th.—(At Bolingbroke Hospital), 9 P.M., Dr. H. L. Tidy: Dyspituitarism, Obesity, and Infantilism.
THURSDAY.—(At St. James' Municipal Hospital, Ouseley-road, Balham), 4 P.M., Dr. H. Wordsworth Barber: Demonstration of Skin Diseases.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N. 15.
MONDAY, March 6th.—3.30 P.M., Dr. L. Yealland: Examination of the Nervous System.
WEDNESDAY.—4.30 P.M., Mr. Norman Fleming: Eye Emergencies.
FRIDAY.—4.30 P.M., Dr. S. C. Shanks: Electro-Therapeutics.
Daily:—2.30 P.M., In-patient and Out-patient Clinics, Operations, &c.

NATIONAL HOSPITAL FOR DISEASES OF THE HEART POST-GRADUATE COURSE, Westmoreland-street, Marylebone, W.
MONDAY, March 6th.—5.30 P.M., Dr. Hamill: Cardio-vascular Neuroses.
Daily:—10 A.M. and 2 P.M., Out-patients and In-patients.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street.
THURSDAY, March 9th.—4 P.M., Dr. Cockayne: Jaundice in Infants.

CANCER HOSPITAL, Fulham-road, S.W.
TUESDAY, March 7th.—4 P.M., Mr. Cecil Rowntree: Cancer of the Breast.
FRIDAY.—4 P.M., Dr. Knox: Radiation in the Treatment of Cancer.

ST. MARYLEBONE GENERAL DISPENSARY, 77, Welbeck-street, Cavendish-square, W.
Post-Graduate Course on Infant and Child Welfare.
WEDNESDAY, March 8th.—6 P.M., Dr. Eric Pritchard: The Tuberculous and Syphilitic Mother and her Child.
FRIDAY.—Rickets.

BRITISH MEDICAL ASSOCIATION (CHESTERFIELD BRANCH) POST-GRADUATE COURSES.
FRIDAY, March 10th.—(At Chesterfield Royal Hospital Board Room) 2.30 P.M., Dr. Naish: Auricular Fibrillation. 3.15 P.M., Mr. Cuff: Common Diseases of the Breast.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE CLINIC.
TUESDAY, March 7th.—4.30 P.M., Mr. A. H. Burgess: Symptomless Hæmaturia.

MANCHESTER FRENCH HOSPITAL, POST-GRADUATE LECTURES, 24, Acomb-street, Whitworth Park.
THURSDAY, March 9th.—4.30 P.M., Dr. A. C. Magian: Difficult Labour.

MANCHESTER BABIES' HOSPITAL POST-GRADUATE LECTURE, Slade-lane, Manchester.
SATURDAY, March 11th.—4 P.M., Dr. Nesta Perry: Dentition.

ST. MARY'S HOSPITALS POST-GRADUATE LECTURE, Whitworth-street West Branch, Manchester.
FRIDAY, March 10th.—4.30 P.M., Dr. Ward: Defects of Growth in Childhood.

SALFORD ROYAL HOSPITAL.
THURSDAY, Mar. 9th.—4.30 P.M., Dr. Addis: Dysmenorrhœa.

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.
Lectures on Tuberculosis and Public Health.
WEDNESDAY, March 8th.—4 P.M., Prof. S. Lyle Cummins: The Clinical Differences in the Course of Tuberculosis in Various Age Groups and Races.

PEOPLE'S LEAGUE OF HEALTH, Royal Society of Arts, John-street, London, W.C. 2.
Course of Lectures on the Mind and What We Ought to Know About It.
MONDAY, March 6th.—6 P.M., Sir Robert Armstrong-Jones: Fatigue and Sleep.

Vacancies.

For further information refer to the advertisement columns.

Aberdeen University and North of Scotland College of Agriculture.—Biochemist. £700.
Ashton-under-Lyne District Infirmary.—Res. Surg. O. £250.
Bedford County Hospital.—Asst. H.S. £150.
Birkenhead Borough Hospital.—Hon. Phys.
Birmingham, St. Chad's Hospital.—Res. M.O. £100.
Bournemouth, Royal Victoria and West Hants Hospital.—Hon. Asst. M.O. and Hon. Path.
Bradford Royal Infirmary.—Two H.S.'s. £200.
Brentwood Mental Hospital, Brentwood, Essex.—Jun. Asst. M.O. £510. Also Locum Tenens Asst. M.O. £7 7s. per week.
Carlisle, Cumberland Infirmary.—Res. M.O. £150.
Chelsea Hospital for Women, Arthur-street, Chelsea, S.W.—H.S. £120.
Chester Royal Infirmary.—Asst. H.S. £150.
Derby Borough Mental Hospital.—Asst. M.O. £350.
East London Hospital for Children, Shadwell.—Asst. S. £50.
Glasgow, Woodilee Mental Hospital, Lenzie.—Asst. M.O. £350.
Great Yarmouth Hospital.—H.S. £200.
Harefield, Middlesex County Tuberculosis Sanatorium.—Asst. Res. M.O. £350.
Kent County Council, Maidstone.—Tuberc. O. £757 11s.
Lancaster County Asylum.—Temp. Asst. M.O. £300.
Liverpool Port.—Asst. Port M.O. £700.
Liverpool, Royal Children's Hospital.—Res. H.P.'s. Res. H.S.'s. £90 each.
Manchester, Ancoats Hospital.—Anæsth. 10s. 6d. per attendance. Med. Reg. £100. H.P. £200.
Manchester, Salford Royal Hospital.—Res. Surg. O. £250. H.P. £200. Two H.S.'s and Cas. H.S. Each £150.
Newcastle-upon-Tyne Hospital for Sick Children.—Hon. Asst. S.
Newport, Mon., Royal Gwent Hospital.—H.S. £200.
Nottingham General Hospital.—Res. Cas. O. £250.
Perth, Murray Royal Asylum.—Asst. Phys. £300.
Putney Hospital (Chester Bequest), Lower Common, S.W.—Res. M.O. £150.
Queen Mary's Hospital, Stratford.—H.P. £150.
Rotherham Hospital.—Jun. H.S. £150.
Royal Free Hospital, Gray's Inn-road.—Gynæcol. Reg. £250.
St. Peter's Hospital for Stone, Henrietta-street, W.C.—Jun. H.S. £75.
Salisbury General Infirmary.—Path. and Bact. £500.
Scarborough Hospital and Dispensary.—Two H.S.'s. £150.
South Shields, Harton Poor-Law Institution, &c.—Asst. Res. M.O. £250.
Stoke-on-Trent, North Staffordshire Infirmary.—H.S. £200.
Sunderland Royal Infirmary.—H.S. £200.
West London Hospital, Hammersmith-road.—H.P. Two H.S.'s. Each £100.
Worcester General Infirmary.—Res. M.O. £200.
Zanzibar.—Asst. M.O.H. £600.

The Chief Inspector of Factories, Home Office, S.W., announces the following vacant appointments: Acle (Norfolk), Newton Abbot (Devon), and St. Boswells (Roxburgh).

Births, Marriages, and Deaths.

BIRTHS.

HUGO.—On Feb. 20th, at Crediton, Devon, the wife of Harold F. L. Hugo, M.B., of a son.
WAUGH.—On Feb. 17th, at Maidstone House, Dover, the wife of Dr. William Waugh, of a son.

MARRIAGES.

DREW—MORRIS.—On Feb. 22nd, at St. Martin-in-the-Fields, Henry William Drew, F.R.C.S., to Judith Emily Morris, widow of Charles Knowlton Morris, of Oakham.
PICKLES—CROSLAND.—At Leeds, Feb. 25th, 1922, at the Parish Church, by the Vicar of Leeds, Harold Dobson Pickles, M.C., M.R.C.S., L.R.C.P., of Headingley, son of J. J. Pickles, Surgeon, of Leeds, to Marianne V., only daughter of Mr. and Mrs. Alvara Crosland, of 88, Belle Vue Road, Leeds.

DEATHS.

FRENCH.—On Feb. 23rd, of pneumonia, Robert Houle French, M.B., M.R.C.S., aged 55.
GREENWAY.—On Feb. 20th, from pneumonia, Alexander Stevenson Greenway, M.D., T.D. (late Lieut.-Colonel, R.A.M.C., T.F.), aged 60 years.
HAWKES.—On Jan. 6th, at Melbourne, Australia, Claude Somerville Hawkes, F.R.C.S.E., aged 55 years.
HUTCHISON.—At his residence, 128, Ashburnham-road, Hastings, on Feb. 24th, George Wright Hutchison, M.D. Aberd. and M.R.C.P. Edin., J.P. for Oxfordshire, in the 75th year of his age, formerly of Chipping Norton, Oxon., eldest and only surviving son of the late Very Rev. George Hutchison, D.D., of Banchory Ternan, Kincardineshire. R.I.P.
JAMES.—On Feb. 20th, at Lonsdale-road, Barnes, Joseph Brindley James, M.R.C.S. Eng., L.R.C.P.I., A.K.C., London, aged 73.
KELSEY.—On Feb. 22nd, at Parkgate, Reigate, Arthur Kelsey, M.R.C.S., L.R.C.P., in his 88th year.
MACMULLAN.—On Feb. 23rd, at Woking, James Neal Macmullan, late Major, R.A.M.C.T.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

THE COÖRDINATION OF MENTAL PROCESSES.

AT the Royal Society of Arts on Feb. 20th Dr. R. G. Rows, Director of the Section of Mental Illnesses at the Tooting Neurological Hospital, delivered an interesting lecture on Association of Ideas, Recognition and Memory, being one of a series of lectures organised by the People's League of Health, on the Mind and What We Ought to Know About It. Referring to the difficulties which confronted the study of mind, Dr. Rows said that the dread which came upon those who found themselves suffering from mental disability was largely based on ignorance, and the experiences of the last few years had shown that mental illness, if taken in the earlier stages and treated on modern lines, was extremely tractable. Modern teaching was not based merely on psychological investigations, and in the future, he thought, advances in our knowledge would come from the study of the physiology of the nervous system generally, and the relations of the organs of the body to that system.

In response to a stimulus there was always a tendency to react, but the same stimulus did not always lead to the same reaction. If there was a real desire to do a certain thing a stimulus would lead in one direction; if, on the contrary, the thing required to be done was irksome, the stimulus would act in an opposite direction. In order that a definite reaction might be brought about, the existence of a mechanism for receiving the stimulus and another for reacting to it must be assumed. This mechanism, simple in the unicellular organism, gradually developed into a brain in the higher animals, when the brain centres received impressions from the outer world through the senses. In the primitive nervous system of the lower organisms, although they reacted to a stimulus, there was practically little choice, and this was to a considerable extent true of the human young. At birth the child had not much choice but that of hunger and other physical conditions. If those conditions were satisfied and led to sleep, nothing much else happened; but gradually, by repetition of stimuli from the external world, the horizon of the child was widened, and it was possible to watch the gradual awakening of its mental activity.

The mind soon learned, through its special centres, the characters possessed by an object, but these characters must be combined in order that a concrete image of an object should be formed. This was known as the process of association, the result of mechanisms within the brain for combining the various records of stimuli. It was an important factor in the development of the mind that the sight of an object was not necessary to revive a picture of the object and its various associations. These could be conveyed by language. When a stimulus was received and transmitted to the brain centres, it must be assumed that along the afferent path a trace was left which was intensified each time the stimulus was repeated. This repetition gave rise to a habit of mind. The mention of snakes, for example, might revive unpleasant past experiences in India, while the hum or whistle of the little trolley-wheel on an overhead tram wire might revive unpleasant memories of exploding shells in France.

Recognition, Dr. Rows went on, depended upon the comparison between present stimuli and the trace of some distant experience stored up in the memory. The oft-repeated phrase—"That reminds me"—exactly conveyed the process which was taking place. There was some stimulus capable of reawakening the memory stored up in the brain, and it might be said that it was impossible to have associations independently of the process of recognition and memory, while it was difficult to see how we could have memory and recognition without association. In order to have a clear conception of a thing all stimuli having nothing to do with that thing must be kept out of consciousness, or, in other words, attention must be given. Mental activity was largely dependent upon the healthy state of our bodily organs, and the influence of the mind on the body must also be recognised.

In analysing a stimulus it would be found that there were three factors inseparably associated in the process of our reaction to it—the intellectual, the emotional, and the physical. A sudden noise would make us jump, and if the noise was a terrifying one there would be muscular trembling, disturbance of the heart and breathing, and perhaps a dry mouth and cold sweat. Anger produced opposite characteristics. The two states of manifestation were specific and could not be mixed. One child taught to fear a thunderstorm by being encouraged to hide itself would associate fear with storms all through life, while another child encouraged to look on the lightning would have a lasting enjoyment. The emotional factor was not sufficiently recognised; for although the external stimulus might determine what sort of reaction would take place, it was the emotions which determined what the character of that response would be.

Mental capacity was improved by thinking out the mechanism which lay at the bottom of mental activity, and this kind of training should begin at the earliest ages. The childish mind was extremely receptive and easily influenced by emotion. A child felt very strongly though perhaps briefly, and it was the training received in earlier years which formed the basis of his mental activity though it might be modified in later life.

The study of the mind, Dr. Rows concluded, would make life more easy for us and more interesting, in that we should have a greater mental content to serve us in carrying on our fight against the difficulties which surrounded the beginning of life.

THE BOSTON CITY HOSPITAL.

THE Boston (U.S.A.) City Hospital comprises a main hospital and infectious and relief departments, as well as a convalescent home, which in their totality minister to an average of 780·6 persons daily, attended by a staff of officers and employees with a daily average of 681·9. The fifty-seventh annual report has many points of interest in regard to finance and management. Taking all the departments together there are 1196 beds and the entire expenditure for the year under notice (Feb. 1st, 1920, to Jan. 31st, 1921) was $1,239,211.29, or something like £255,000, the per capita cost at the hospital proper being about $3.70 per day per ward patient, while at the convalescent home the cost per patient was more than a dollar less. The revenue of the hospital from all sources was $171,759.93, including $15,091.07 collected by the health department and $151,917 from patients, for the care of infectious cases. The report from the neurological department notes that, while the effect of prohibition has been to produce a marked diminution in the number of cases treated for alcoholic psychoses, the presence of a mild epidemic of poliomyelitis and the persistence of a small epidemic of encephalitis more than made up for any decrease in alcoholic cases. A statement in connexion with the pathological department points out that there is an increasing difficulty in keeping for any length of time good assistants in the laboratory owing to the great demand everywhere at high salaries for men well trained in pathology. The medico-social work of the hospital makes very interesting reading, the teaching of invalid children in coöperation with the public school department and the formation of a children's library being particularly noteworthy.

THE LIFE-STORY OF A BLIND LEPER.

AN account of an unusual disease written by one of its victims always demands attention. This is perhaps due less to its scientific than to its human interest, though occasionally when the patient is himself a trained observer both elements are present. The February number of *St. Bartholomew's Hospital Journal* contains an article which is peculiarly terrible, from the human point of view, inasmuch as it has been written by a blind leper. The patient, who was recently the subject of a clinical lecture at the hospital by Sir Leonard Rogers, has now supplemented the scientific account by a record of his own feelings. He had spent his boyhood in contact with numerous cases of the disease, and the first symptoms in himself appeared at the age of 13 in the form of a discolouration of the skin. Soon afterwards numbness of the fingers began to interfere with proficiency at cricket, a trivial sign heralding the awful physical decay which steadily developed afterwards. Iritis appeared at the age of 23, and three years later the patient was almost completely blind. During the same period he began to lose some of the distal phalanges of his fingers and toes. About the age of 28 ulceration of the mouth and larynx started, but this was checked, the patient believes, largely owing to the use of tobacco. From an early stage of the disease chaulmoogra oil in one form or another was used in treating it, but without much effect, and at the present time the patient's leonine face, sightless eyes, and mutilated hands bear witness to the helplessness of medical science. A pathetic comment on this is the patient's appeal to his doctors to consider more carefully than they do the psychology of their patients. He seems to have suffered from being of great clinical interest, and has seldom been allowed to forget that he was ill. It may be supposed, however, that a disease so terrible, even in the absence of constant reminders from without, will scarcely permit its victims to be unconscious of its ever tightening grip.

THE MEDICAL SERVICE OF NEW ZEALAND.

IN the November issue of the *New Zealand Journal of Health and Hospitals* appears an article discussing the need, supply, and distribution of medical men throughout the Dominion, the ratio of one practitioner to every 1500 of the population being taken as a basis upon which to work. The present population of the Dominion, including Maoris, is calculated to be 1,271,000; the latest issue of the quarterly register of practitioners compiled by the Health Department contains 918 names, so that the supply necessary may be said already to exist. In addition to the 918 registered medical men there are some 200 either absent from the Dominion or retired from practice. The annual growth of population in New Zealand has averaged over 35,000 since 1911; to provide for an annual increase of 35,000, and to replace deaths and retirements of medical men, a total of 58 is suggested. An annual average supply of 43 has been secured from the New Zealand Medical School and from overseas during the past ten years; there is a satisfactory increase in the number of New Zealand graduates for this purpose, and for some time past the Department has had very few practices on hand, even in country districts, to offer to inquirers, whilst some centres are very well supplied with practitioners. The following table shows the distribution of medical men in active practice throughout the Dominion, the population of the various hospital districts, and the rate of population to each practitioner:—

Hospital district.	Total population of hospital district.	Number of practitioners.	Rate of population to each practitioner.
Mangonui	6,705	3	2235
Whangaroa	1,560	1	1560
Bay of Islands	6,587	3	2196
Hokianga	6,884	1	6884
Kaipara	12,559	6	2093
Whangarei	14,745	10	1475
Auckland	183,035	125	1464
Waikato	69,039	37	1866
Thames	16,565	12	1380
Waihi	4,975	2	2488
Coromandel	2,750	1	2750
Tauranga	8,541	4	2135
Bay of Plenty	10,901	5	2180
Taumarunui	10,681	4	2670
Waiapu	4,989	2	2495
Cook	24,955	12	2080
Wairoa	6,805	3	2268
Hawke's Bay	36,953	26	1421
Taranaki	28,952	12	2413
Stratford	10,554	3	3515
Hawera	19,262	11	1751
Patea	5,676	2	2838
Wanganui	50,102	31	1616
Waipawa	21,877	13	1616
Palmerston North	50,053	25	2002
Wellington	112,339	68	1652
Wairarapa	34,906	17	2053
Wairau	13,086	7	1869
Picton	3,662	2	1831
Nelson	26,663	18	1481
Westland	7,831	4	1958
Buller	10,375	7	1482
Inangahua	4,400	2	2200
Grey	13,025	5	2605
North Canterbury	144,716	84	1723
Ashburton	17,192	9	1910
South Canterbury	40,192	25	1608
Waitaki	16,387	10	1639
Otago	96,792	80	1429
South Otago	17,531		
Vincent	5,400	3	1800
Maniototo	2,975	4	744
Southland	55,872	29	1958
Wallace and Fiord	11,293	3	3764

It is stated that this table indicates to those with knowledge of the districts that whilst some of the latter are well supplied, others remain capable of supporting further medical men.

"ACOUSTIQUE" ELECTRICAL AIDS FOR THE DEAF.

THE Acoustique Company, of 95, Wigmore-street, London, W., have submitted to us the electrical apparatus made by them as aids to hearing for the deaf; 22 distinct types of instrument are manufactured by them, besides a stethoscope for the use of deaf doctors and an attachment for use with the telephone; these should be helpful in appropriate circumstances. The instruments are on the ordinary telephone principle usual in these machines, and consist of receiver, dry cell, and transmitter, and may be variously arranged; the transmitter may be attached rigidly or by a flexible cord to the battery and, when rigidly fixed, may be used as a table instrument, a hinge between the battery-case and the transmitter allowing the latter to be placed in the necessary vertical position. In some patterns the transmitters are multiple, and some of the double transmitters are arranged back-to-back with a metal reflector fitted over the posterior one; it is claimed that this arrangement, which certainly economises space, assists in eliminating buzz and adventitious sounds. A feature of these instruments is the awkwardly named "non-head attachment," which is simply a length of indiarubber tubing, fitting at one end by a nipple into the ear and by the other end screwing into the receiver; it is said that this device improves timbre and avoids buzz, and it certainly has the advantage that the receiver can be placed in the pocket and not held applied to the ear. A head-band and a lorgnette handle are also supplied; some patterns have a switch on the transmitter as well as on the receiver, and many are fitted with a resistance for regulating the strength of current. The more powerful instruments with multiple transmitters are of the table pattern. One, "Table type 11," is the smallest apparatus of the kind we have seen, and is very efficient for its size; the box is 4¾ in. long by 3¼ in., and is very light and portable. The instruments are well made and well finished, and give a good natural tone with a pleasurable absence of metallic timbre. The prices vary from 6 guineas for the smallest to 20 guineas for the table apparatus just mentioned. These electrical instruments should go far towards destroying the too general prejudice against the use of hearing aids.

LONGEVITY.

IN the first number of *La Ginecologia Pratica*, a new obstetrical review published at Genoa, reference is made to a case of longevity in a Turk named Djouro, a native of the Caucasus, said to have been born in 1775, and therefore to have attained the ripe age of 146 years. Mr. Djouro is reported to be about to visit Paris and London with his family, which includes a son aged 96, but remembering how long ago this visit was first promised, we have doubts whether it will come off. Nor will it provoke much interest unless something in the nature of official records substantiates a good part of the claim—say, 75 per cent. The names of other "ultracentenarians" are recalled in this connexion by our contemporary, as follows: Henry Jenkins, who died in 1670 aged 169; Thomas Parr, died 1710, aged 160; Pietro Czartan, died 1724, aged 185; and Katherine Fitzgerald, Countess of Desmond, died 1604, aged 140. With regard to the last-named centenarian, we may add, it has been thought that the traditional 140 resulted from an accidental transposition of the figures 104, while there is no proper evidence to support the claims to excessive longevity in two of the other cases.

E. S. D.—The nutritive value of meat lies mainly in its protein content (17–21 per cent.), to a lesser degree in its fat content (1·5–29 per cent.), and to a still lesser degree in its gelatin content (about 2 per cent.). There can be no doubt, however, that the extractives, salts, and vitamins, are of physiological value to the consumer in various ways, as, for instance, in promoting digestion, in maintaining the necessary supply of mineral matter, and in bringing about harmonious relationships between the various metabolic processes. On these grounds alone, whether directly or indirectly, the nutritive value of different kinds of meat differs in some small measure with the so-called quality. As far as is known, freezing or chilling does not impair the nutritive qualities of the protein and fat, and any deleterious influence on the vitamin content can be made good under normal conditions by a supplementary supply of vegetables, fruits, and butter.

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